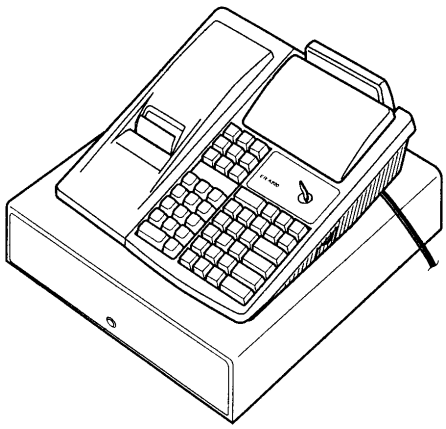
ER-A220

SHARP SERVICE MANUAL

CODE : 00ZERA220VSME



ELECTRONIC CASH REGISTER

MODEL ER-A220

(For "V" version)
SRV Key : LKGIM7113RCZZ
PRINTER : LTP-1245

CAUTION

EXTREME CAUTION MUST BE TAKEN WHEN SERVICING THIS MACHINE. EVEN THOUGH THE MODE SWITCH IS IN THE OFF POSITION, VOLTAGE IS STILL SUPPLIED TO THE ENTIRE MACHINE.
WHEN WORKING ON THIS MACHINE MAKE SURE THAT THE POWER CORD IS REMOVED FROM THE WALL OUTLET.

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PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CHAPTER 1. SPECIFICATIONS

1. Appearance/Rating

1) Rating

Power source	AC local voltage(±10%), 50/60Hz
Power consumption	Max. 45W, Stand-by : 20W
Operating temperature	0°C~40°C
Operating humidity	10%~90%
Physical dimensions, including the drawer	330(W) x 363(D) x 238(H)mm
Weight	8.9 kg

2. Keyboard

1) Standard keyboard layout (15 Departments)

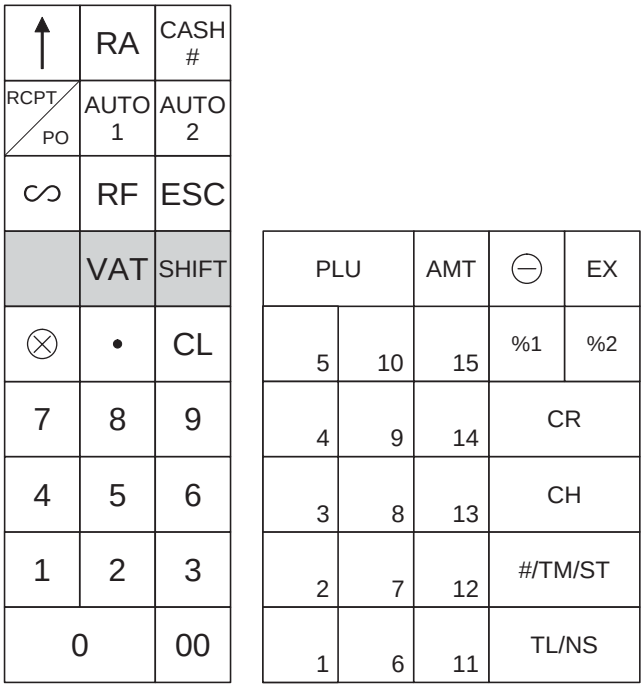
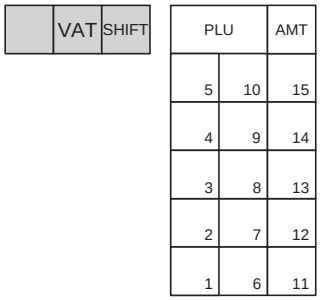


Fig. 2-1

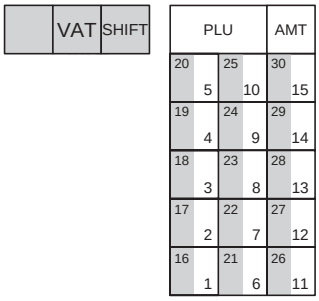
2) Option keyboard layout

There are following Department keylayout selections by PGM programming (JOB#61-A)

1. 15 Departments



2. 30 Departments



3) Key top name

Standard Key Top

KEY TOP	DESCRIPTION
0 to 9,00	Numeric keys
•	Decimal point key
CL	Clear key
⊗	Multiplication key
1 to 15	Department 1 to 15 keys
↑	Paper feed key
CASH #	Cashier code entry key
RA	Received on Account key
∞	Void key
AUTO 1, 2	Automatically Entry key 1, 2
EX	Currency conversion key
PLU	PLU/Subdept code entry key
AMT	Amount Entry key
%1, 2	% key 1, 2
(–)	Discount key
SHIFT	Department shift key for DEPT. 16 – 30 key
CH	Check key
CR	Credit key
TL/NS	Total and No sale key
RCPT/PO	After receipt issue & Paid out key
RF	Refund key
#/TM/ST	Non-add code entry, Time display and Tax included subtotal key

Optional Key Top

KEY TOP	DESCRIPTION
16-30	Department key 16-30

3. Mode switch

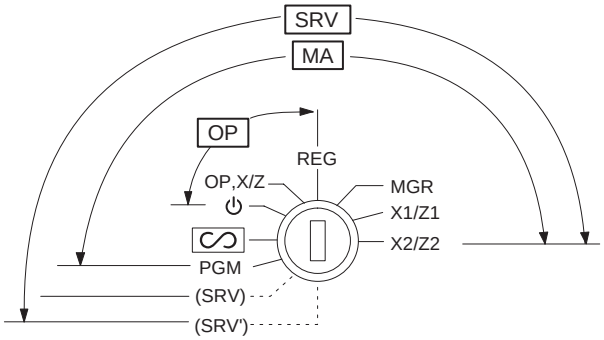


Fig. 3-1

∗ The key can be removed in the REG or ⏻ position.

∗ In the SRV' mode, key inputs are prohibited and no display is made.

∗ With the key in the off position power is not supplied to the main PWB.

[Functions]

- Function for each key position
- SRV ' : System reset
- SRV : Service mode (SRV/PGM programming)
- PGM : Allows programming of an item that is not changed frequently, in addition to the PGM mode programming.
- OP, X/Z : Allows X or Z operation by cashiers.
- REG : Allows registrations.
- MGR : Allows the operations, by authorized person such as a manager (e.g. correction after transaction finished or cancellation of entry limits), which are not permitted to ordinary cashiers.
- X1/Z1 : Allows reading and resetting of a day's sales total.
- X2/Z2 : Allows reading or resetting sales totals in a specified period.
- ⏻ : Switching off the display to prevent key board entries. (The setting turn off the AC power.)
- [CL] : After-transaction voiding (void mode)

4. Display

1) Layout

① Operator display

Fig. 4-1

	7 segment display (LED)
No. of positions	10
Color of display	Yellow Green
Character size	14.2 (H) × 8.0 (W) mm

② Customer display (Pop-up type)

Fig. 4-2

	7 segment display (LED)
No. of positions	7
Color of display	Yellow Green
Character size	14.2 (H) × 8.0 (W) mm

Display contents

****

	Display Position	Description
Amount	1-8	
Minus sign	4-10	– : Floating
Error	8-10	Exx : xx = Error code
PGM Mode	10	P
TL/NS CH, CR	10	F : Lights up when a registration is finalized by depressing TL/NS, CH, CR key
SUB TOTAL/ short tender	10	o : Light up when the subtotal is displayed or when the amount tendered is smaller
Change	10	C : Light up when the change due amount appears in the display.
Department	9-10	No zero-suppressed
PLU	8-10	No zero-suppressed
Repeat	8	Endless count, starting from 2.
Cashier No.	2	–x– : Cashie No.
Receipt OFF	9	_
CCD compulsory	10	C : Light up when CCD is compulsory
EJ full	8 - 10	E-E : Light up when EJ memory is FULL at the timming of key entry (by PGM selection).
currency conversion	10	c : Light up when the EX key is pressed to calculate a subtotal in foreign currency.

<Decimal Point>

	Display Position	Description
Decimal point	4-1	
TAB	4-1	
EJ near full	8, 9	(at the timing of finalization of a transaction) (by PGM selection)
Power save mode	10	Power save mode

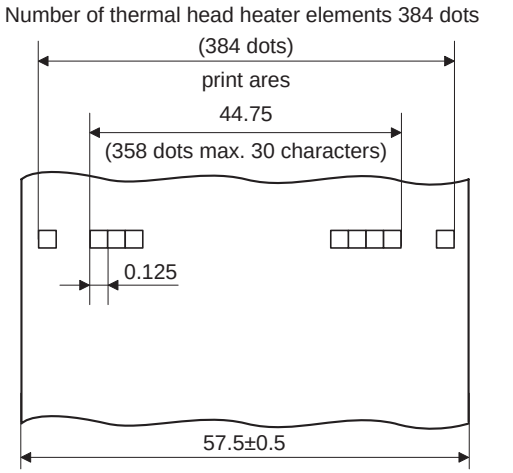
Error code list

No.	Description
01	Registration error
02	Misoperation error
03	Desired code is not programmed yet
04-06	(not used)
07	Memory is full
08-10	(not used)
11	Compulsory of pushing the SBTL key
12	Compulsory of tendering
13-21	(Not used)
22	Over lapped cashier error
23	Cashier resetting over error
24-31	(Not used)
32	The cashier is not assigned
33	(Not used)
34	Overflow limitation
35	The open price entry is inhibited
36	The unit price entry is inhibited
37	The direct non-tendering finalization after previous tender entry is inhibited.
38-66	(Not used)
67	REG Buffer full (ST VOID is inhidited)
68-85	(not used)
86	Communication error (ECR data copy)
87	Data error (ECR data copy)
88	Time out error (ECR data copy)

5. Specifications

1) Printer (LTP-1245)

- No. of station: 1: Receipt or Journal
- Validation: No
- Printing system: Line thermal
- No. of dot: 384 dots
- Dot pitch: Horizontal: 0.125 mm
  Vertical: 0.125 mm
- Font: 10 dots (W) x 24 dots (H)
- Printing capacity: Max. 30 characters
- Character size: 1.125 mm (W) x 3 mm (H):
  At 10 x 24 dots
- Print pitch: Column distance :1.5 mm
  Row distance :3.75 mm
- Print speed: Approximate 40 mm/s
- Paper feed speed (Manual feed): Approximate 40 mm/s
  Approximate 30 mm/s
- Reliability: Mechanism MCBF 4 million lines
  used to high-quality thermal paper
- Paper end sensor: Yes
- Cutter: No
- Near end sensor: No
- Printing area:



2) Paper

Item	Description
Name	High-quality thermal paper
Roll dimension	57.5 ± 0.5 mm in width Max. 70 mm in diameter
Thickness	0.06 mm to 0.08 mm

3) Cutter

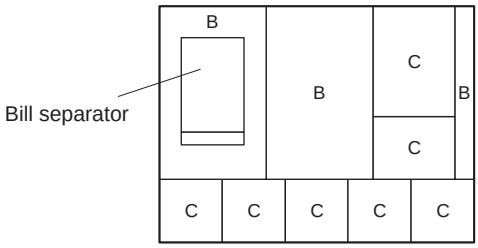
- Method : Manual

6. Drawer: Not standard equipment

1) Drawer box

Item	Description
Model name	SK-360
Size	329(W) x 363(D) x 106(H)
Color	Gray 368
Material	Metal
Bell	No
Release lever	Standard equipment: Situated at the bottom
Drawer open sensor	No

2) Money case



3) Lock

Item	Description
Location of the lock	Front
Method of locking	To lock, inset the drawer lock key into the lock and turn it 90 degrees counterclockwise. To unlock, insert the drawer lock key and turn it 90 degrees clockwise.
Key No.	SK1-1

CHAPTER 2. OPTIONS

1. Options

No.	NAME	MODEL	DESCRIPTION
1	REMOTE DRAWER	ER-05DW/06DW	
2	KEY TOP KIT	ER-11KT7	1 x 1 KYE TOP UNIT
		ER-12KT7	1 x 2 KYE TOP UNIT
		ER-22KT7	2 x 2 KYE TOP UNIT
		ER-11DK7G	1 x 1 DUMMY KYE KIT
		ER-51DK7G	5 x 1 DUMMY KYE KIT

2. Service options

No.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	SERVICE KEY	LKGiM7113RCZZ	AF	
2	MODE KEY GRIP COVER	LKGiM7126RCZZ	AL	OP key only
3	DRIP-PROOF KEYBOARD COVER	GCŌVH2486BHZZ	BD	Include the switch cover

3. Service tools

No.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	RS-232 LOOP BACK CONNECTOR	UKŌG-6705RCZZ	BU	
2	KEY TOP REMOVER	UKŌG-6634RCZZ	AX	
3	2 x 2 KEY TOP INSTALLING JIG	UKŌG-6725BHZZ	BP	

4. Supplies

No.	NAME	PARTS CODE	PRICE RANK	DESCRIPTION
1	ROLL PAPER	TPAPR2377RC05	AY	5 roll/pack

CHAPTER 3. SERVICE (SRV) MODE

CAUTION

Before turning the mode switch from the (SRV') to (SRV), make sure the AC power cord is connected to the wall outlet; otherwise, the data on memory might be destroyed.

The SRV key is used for operating in the SRV mode.

1. SRV. reset (Program Loop Reset)

Used to return the machine back to its operational state after a lock-up has occurred.

Procedure

1) Unplug the AC cord from the wall outlet.
2) Set the mode switch to (SRV') position.
3) Plugin the AC cord to the wall outlet.
4) Turn to (SRV) position from (SRV') position.

PROGRAM RESET ✶✶✶

2. Master reset (All memory clear)

Used to clear all memory contents and return machine back to its initial settings. return keyboard back to default. for default keyboard layout.

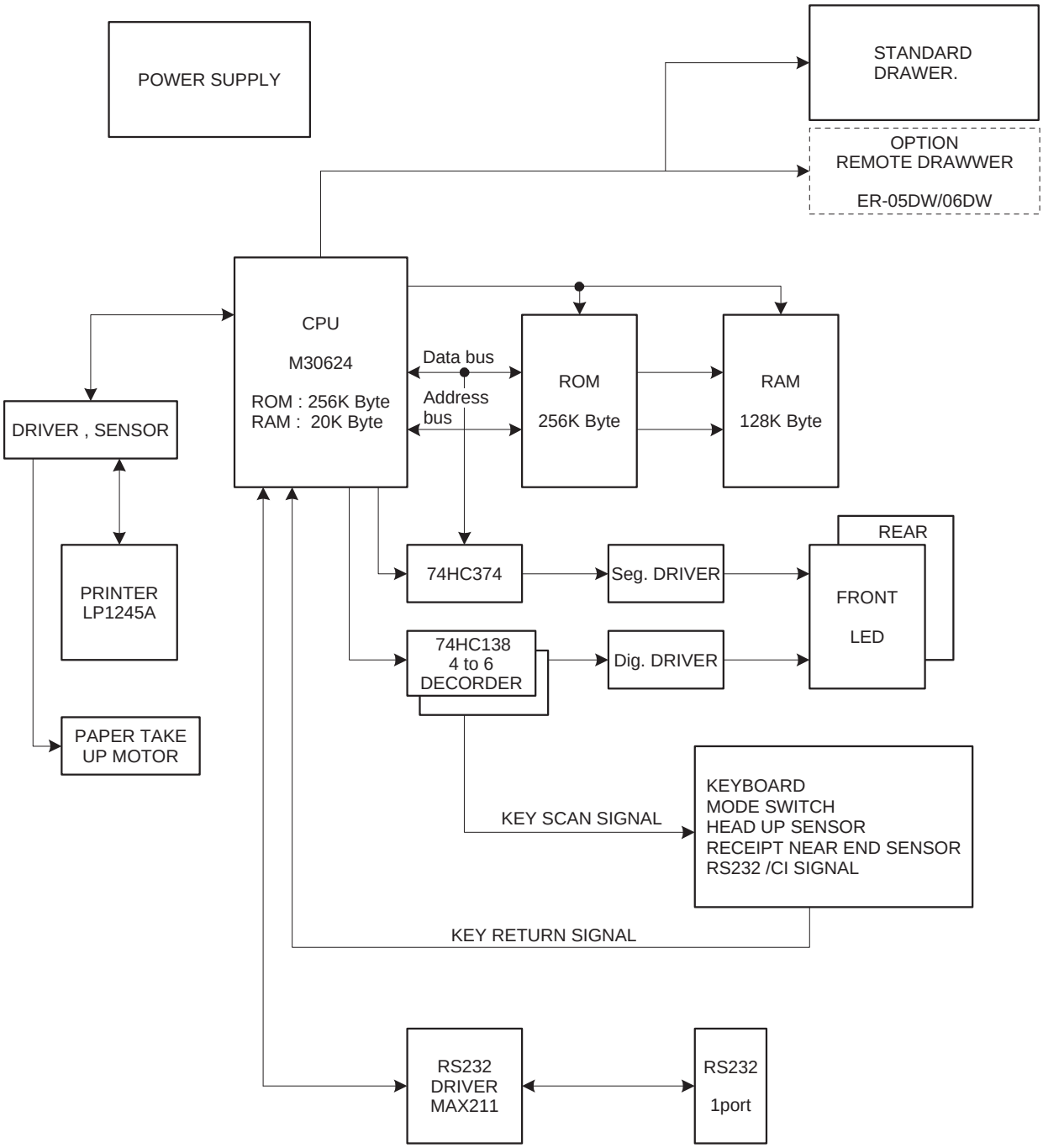
Procedure

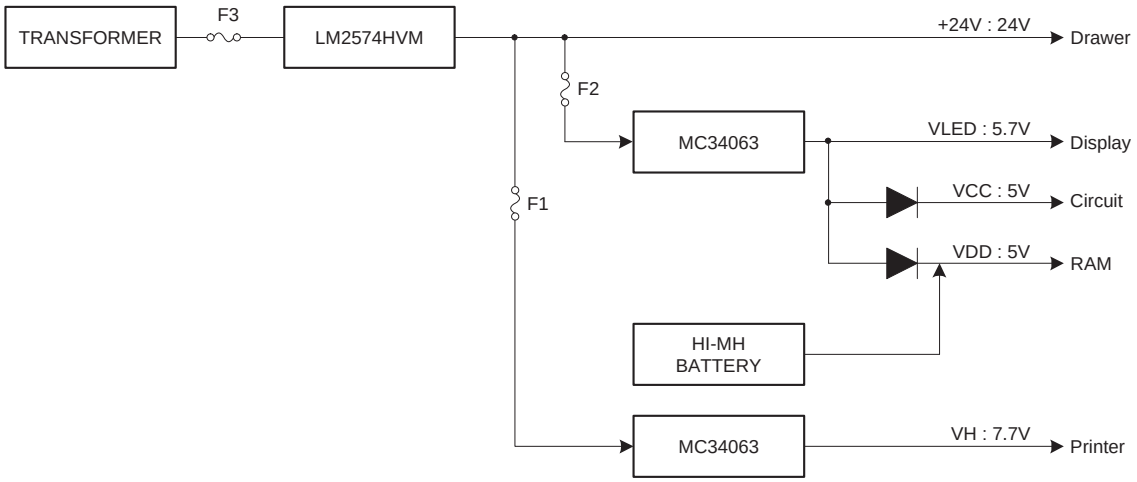
1) Unplug the AC cord from the wall outlet.
2) Set the MODE switch to the (SRV') position.
3) Plugin the AC cord to the wall outlet.
4) While holding down JOURNAL FEED key, turn to (SRV) position from (SRV') position.

MASTER RESET ✶✶✶

CHAPTER 4. HARDWARE DESCRIPTION

1. Hard ware block diagram

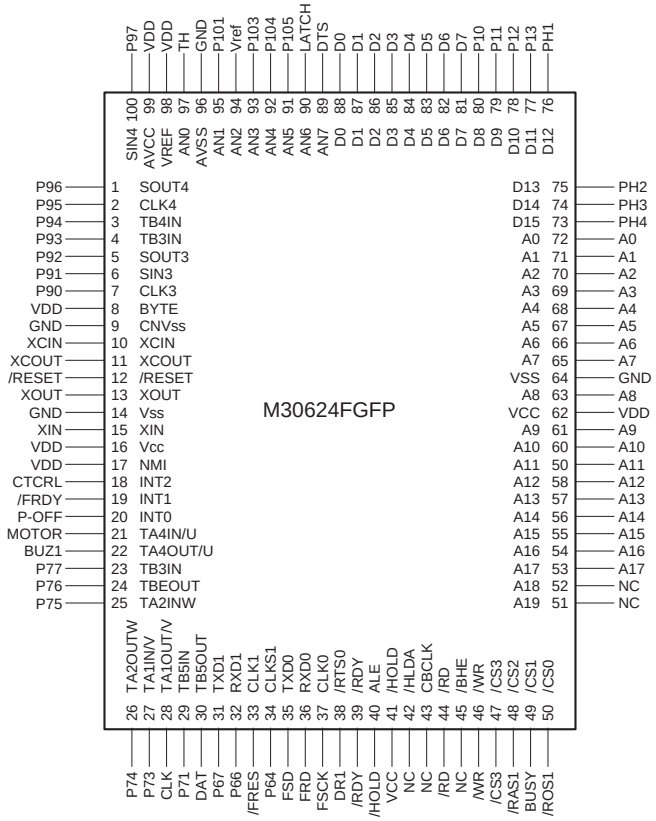




2. Description of main LSI's

2-1. CPU (M30624FGFP)

1) Pin configuration



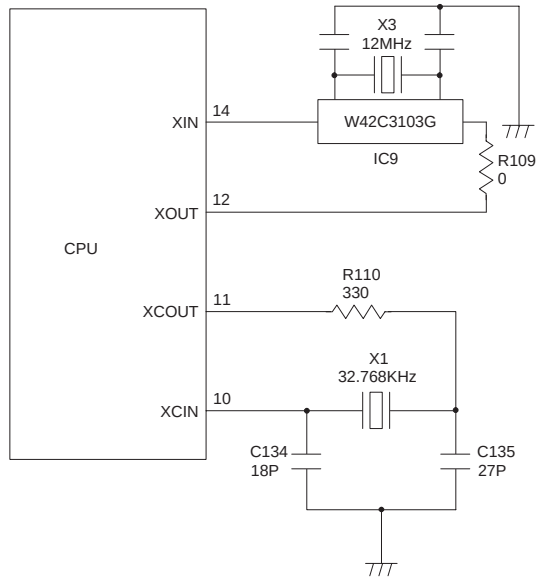
2) Pin description

Pin No.	SYMBOL	SIGNAL NAME	In/Out	Function
1	SOUT4	P96	In	Key return :6
2	CLK4	P95	In	Key return :5
3	TB4IN	P94	In	Key return :4
4	TB3IN	P93	In	Key return :3
5	SOUT3	P92	In	Key return :2
6	SIN3	P91	In	Key return :1 and Master reset SW
7	CLK3	P90	In	Key return :Mode SW
8	BYTE	VDD	In	VDD
9	CNVss	CNVss	In	Normal : L Booting : H
10	XCIN	XCIN	In	Calender clock :32.768KHz
11	XCOUT	XCOUT	In	Calender clock :32.768KHz
12	/RESET	/RESET	In	Reset
13	XOUT	XOUT	Out	System clock :12MHz
14	Vss	GND	In	GND
15	XIN	XIN	In	System clock :12MHz
16	Vcc	VDD	In	VDD
17	NMI	VDD	In	VDD
18	INT2	CTCRL	Out	Paper feed motor current control
19	INT1	/FRDY	In	FMC :Ready
20	INT0	P-OFF	In	Power off
21	TA4IN/U	MOTOR	Out	Paper take up motor drive
22	TA4OUT/U	BUZ1	Out	Buzzer drive
23	TB3IN	P77	In	RS232 :DR
24	TBEOUT	P76	In	RS232 :CS
25	TA2INW	P75	In	RS232 :CD
26	TA2OUTW	P74	Out	RS232 :ES
27	TA1IN/V	P73	Out	Printer head rank check On/Off
28	TA1OUT/V	CLK	Out	Printer data clock
29	TB5IN	P71	Out	/HOLD control
30	TB5OUT	DAT	Out	Print data
31	TXD1	P67	Out	RS232 :SD
32	RXD1	P66	In	RS232 :RD
33	CLK1	/FRES	Out	FMC :Reset
34	CLKS1	P64	Out	RS232 :RS
35	TXD0	FSD	Out	FMC :Send data
36	RXD0	FRD	In	FMC :Receive data
37	CLK0	FSCK	Out	FMC :Shift clock
38	/RTS0	DR1	Out	Drawer drive

Pin No.	SYMBOL	SIGNAL NAME	In/Out	Function
39	CLKOUT	/RDY	In	VCC
40	ALE	NC	Out	NOT USE
41	/HOLD	/HOLD	In	Controled by P71
42	/HLDA	NC	Out	NOT USE
43	CBCLK	NC	Out	NOT USE
44	/RD	/RD	Out	Read
45	/BHE	NC	Out	NOT USE
46	/WR	/WR	Out	Write
47	/CS3	CS3	Out	Display segment latch
48	/CS2	/RAS1	Out	Chip select :for RAM
49	/CS1	BUSY	In	FMC :Busy
50	/CS0	/ROS1	Out	Chip select :for ROM
51	A19	NC	Out	NOT USE
52	A18	NC	Out	NOT USE
53	A17	A17	Out	Address bus :17
54	A16	A16	Out	Address bus :16
55	A15	A15	Out	Address bus :15
56	A14	A14	Out	Address bus :14
57	A13	A13	Out	Address bus :13
58	A12	A12	Out	Address bus :12
59	A11	A11	Out	Address bus :11
60	A10	A10	Out	Address bus :10
61	A9	A9	Out	Address bus :9
62	VCC	VDD	In	VDD
63	A8	A8	Out	Address bus :8
64	VSS	GND	In	GND
65	A7	A7	Out	Address bus :7
66	A6	A6	Out	Address bus :6
67	A5	A5	Out	Address bus :5
68	A4	A4	Out	Address bus :4
69	A3	A3	Out	Address bus :3
70	A2	A2	Out	Address bus :2
71	A1	A1	Out	Address bus :1
72	A0	A0	Out	Address bus :0
73	D15	PH4	Out	Paper feed motor :Phalse4
74	D14	PH3	Out	Paper feed motor :Phalse3
75	D13	PH2	Out	Paper feed motor :Phalse2
76	D12	PH1	Out	Paper feed motor :Phalse1
77	D11	P13	Out	Key/Display :Strobe3
78	D10	P12	Out	Key/Display :Strobe2
79	D9	P11	Out	Key/Display :Strobe1
80	D8	P10	Out	Key/Display :Strobe0
81	D7	D7	InOut	Data bus :7
82	D6	D6	InOut	Data bus :6
83	D5	D5	InOut	Data bus :5
84	D4	D4	InOut	Data bus :4
85	D3	D3	InOut	Data bus :3
86	D2	D2	InOut	Data bus :2
87	D1	D1	InOut	Data bus :1
88	D0	D0	InOut	Data bus :0
89	AN7	DTS	Out	Printer head drive
90	AN6	LATCH	Out	Printer data latch
91	AN5	P105	Out	Printer head voltage ON
92	AN4	P104	Out	CG ROM Bank
93	AN3	P103	In	Head rank
94	AN2	Vref	In	Base voltage :2.495V
95	AN1	P101	In	Printer head voltage check
96	AVSS	GND	In	GND
97	AN0	TH	In	Print head temperature check
98	VREF	VDD	In	VDD
99	AVCC	VDD	In	VDD
100	SIN4	P97	In	Key return :7

3. Clock generator

1) CPU



Two oscillators are connected to the CPU.

The basic clock X3 is supplied from a 12MHz oscillator.

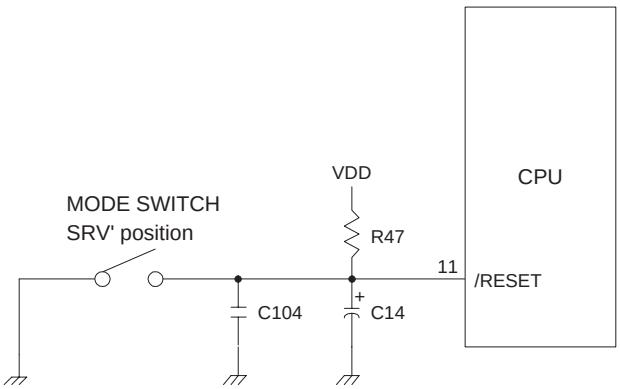
The 12Mhz basic clocks are formed by X3 and W42C21 and inputted to the Xin pin of the CPU.

If the CPU was not operating properly, the signal does not appear on this line in most cases.

The sub-clock X1 generates 32.768KHz which is primarily used to update the internal RTC (real time clock).

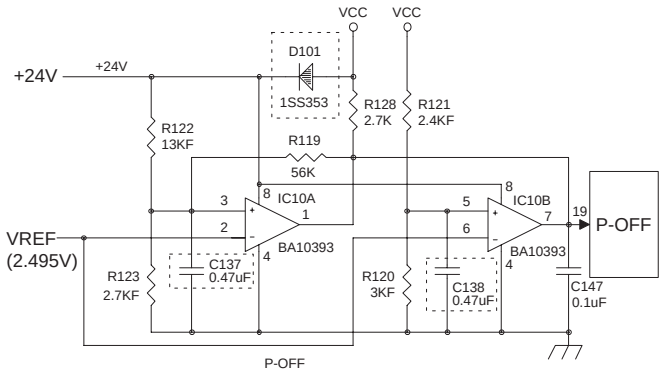
During the standby mode, it keeps oscillating to update the clock and monitoring the power recov-ery.

4. Reset circuit



When the mode switch is placed in the "SRV" position, the reset signal is sent to the CPU to reset the hardware.

5. P-OFF circuit



The P-OFF signal detects two signals by two comparators and sent to the CPU.

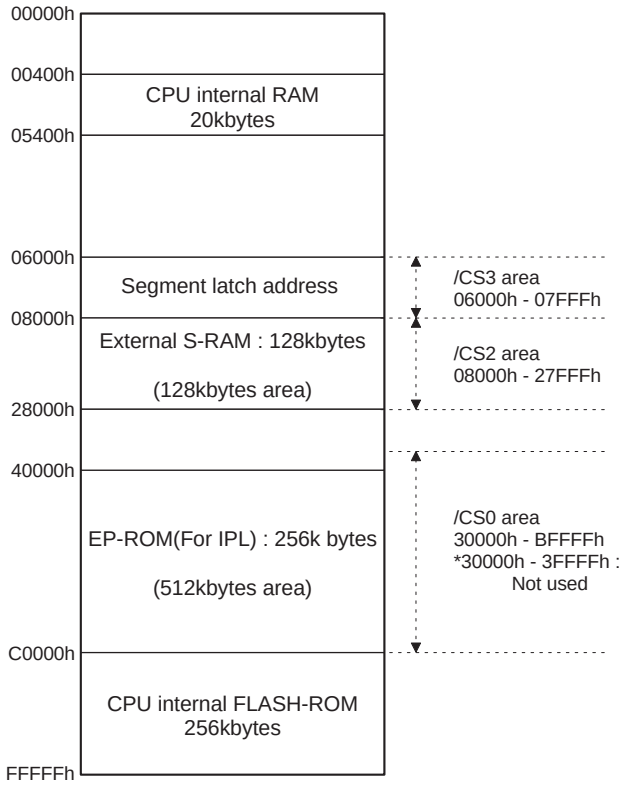
+24V signal : When the mode switch is placed in the OFF position, the P-OFF output from the comparator: IC10A becomes low to turn the power off.

When the mode switch is in positions other than OFF, the P-OFF output from the comparator:IC10A becomes high to turn the power on.

VCC signal : Though the MODE switch is at ON position, if the logic power voltage Vcc falls below the specified level, the P-OFF signal is driven to LOW by the comparator IC10B.

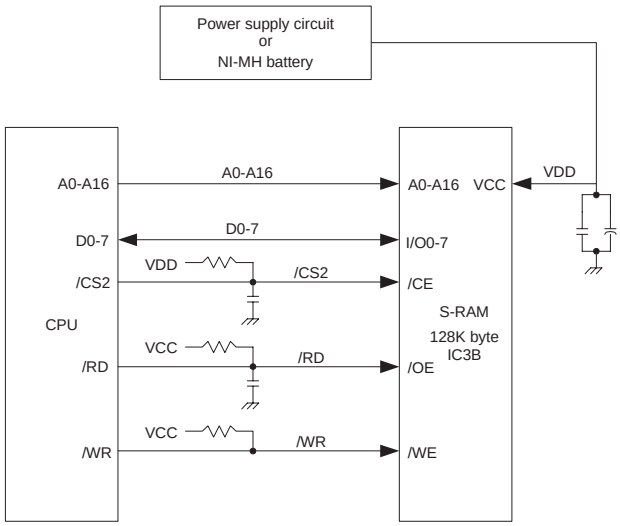
6. Memory circuit

1) Address map

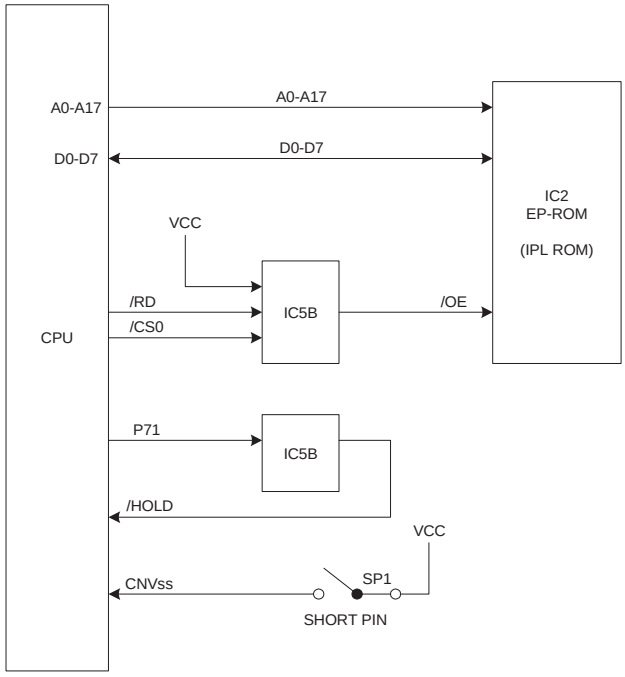


EP-ROM : Not available as standard equipment. The EP-ROM socket is provided for rewriting the program for the CPU internal FLASH-ROM.

2) RAM control



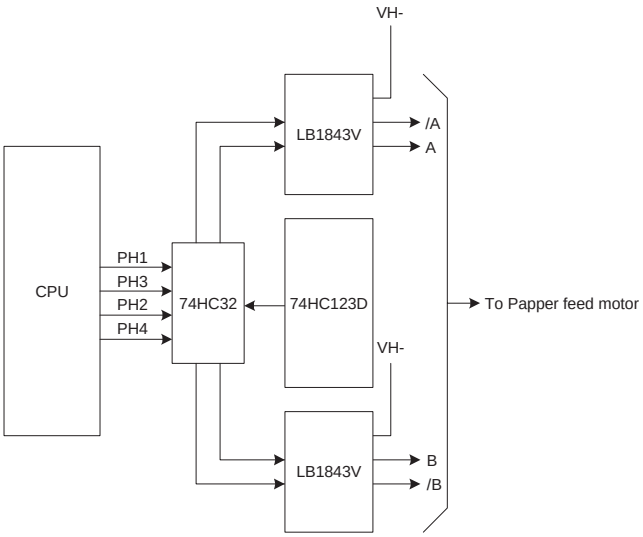
3) EP-ROM (IPL ROM) control



IC2 : EP-ROM (IPL ROM) is used to write data onto the CPU internal FLASH-ROM.

7. Printer control circuit

1) Paper feed motor circuit



A pulse motor is used as the paper feed motor.

Drive sequence of the pulse motor is as follows:

SEQUENCE	SIGNAL			
	A	/A	B	/B
STEP1	High	Low	Low	High
STEP2	High	Low	High	Low
STEP3	Low	High	High	Low
STEP4	Low	High	Low	High

2) Print circuit

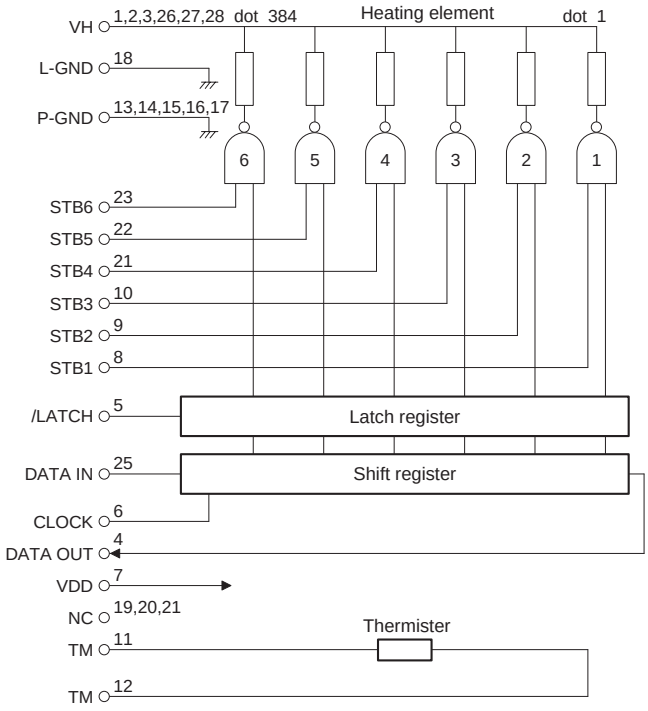
① Thermal head configuration

As shown in the equivalent circuit in the figure, thermal head consists of heating elements and head drivers which drives and controls those heating elements.

The serial print data input through the DATA IN (D1) is transferred to the shift register synchronizing with the CLOCK (CP) and stored in the latch register by the LATCH (LA) signal.

The head conduction signals (print commands 1 ~ 6) turn the gate on to conduct the heating element corresponding to the print data.

Equivalent circuit of thermal head



STB terminal is pulled down inside the IC.

② Head splitting

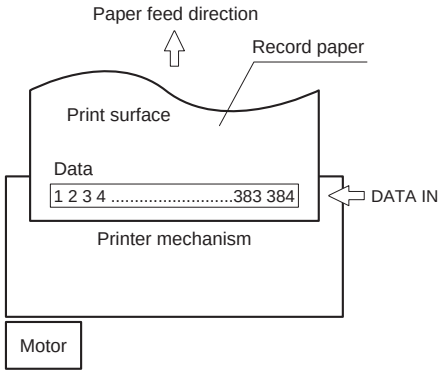
The thermal head has 6 strobes so that it is possible to print dividing up to 6 times. The relationship between the strobes and heating elements is shown below.

Strobe terminals and conduction heating elements

STB No.	Heating element No.	Number of dots/STB
1	1 ~ 64	64
2	65 ~ 128	64
3	129 ~ 192	64
4	193 ~ 256	64
5	257 ~ 320	64
6	321 ~ 384	64

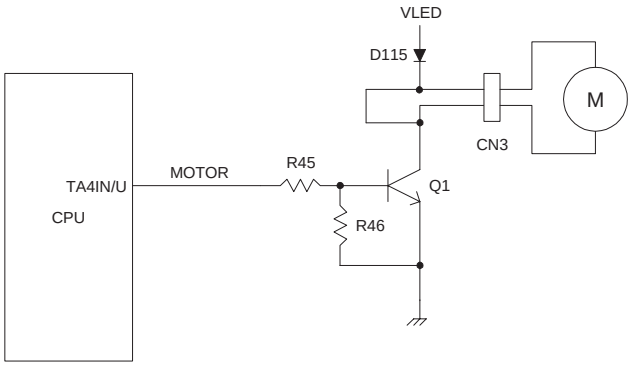
③ Print data and printing position

384-bit data No.1 ~ 384 transferred by the DTA IN (DI) are printed in the position shown in the figure.



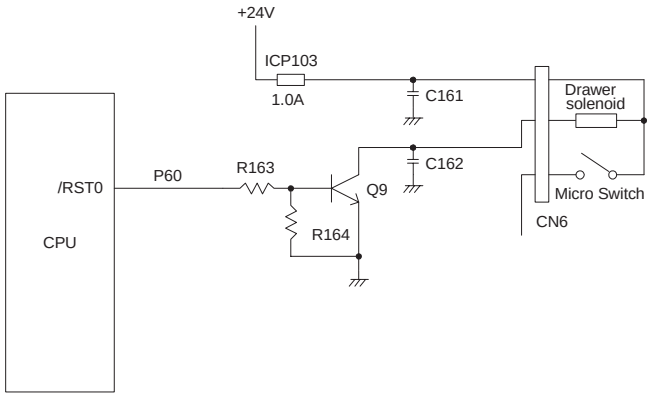
Print data and printing position

8. Paper take up motor drive circuit



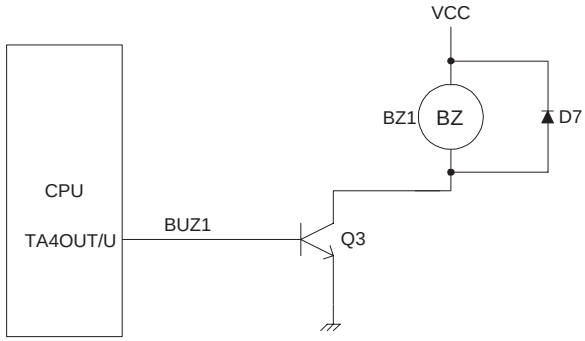
When the MOTOR signal from the CPU is HIGH, Q1 is turned on to operate the motor.

9. Drawer drive circuit



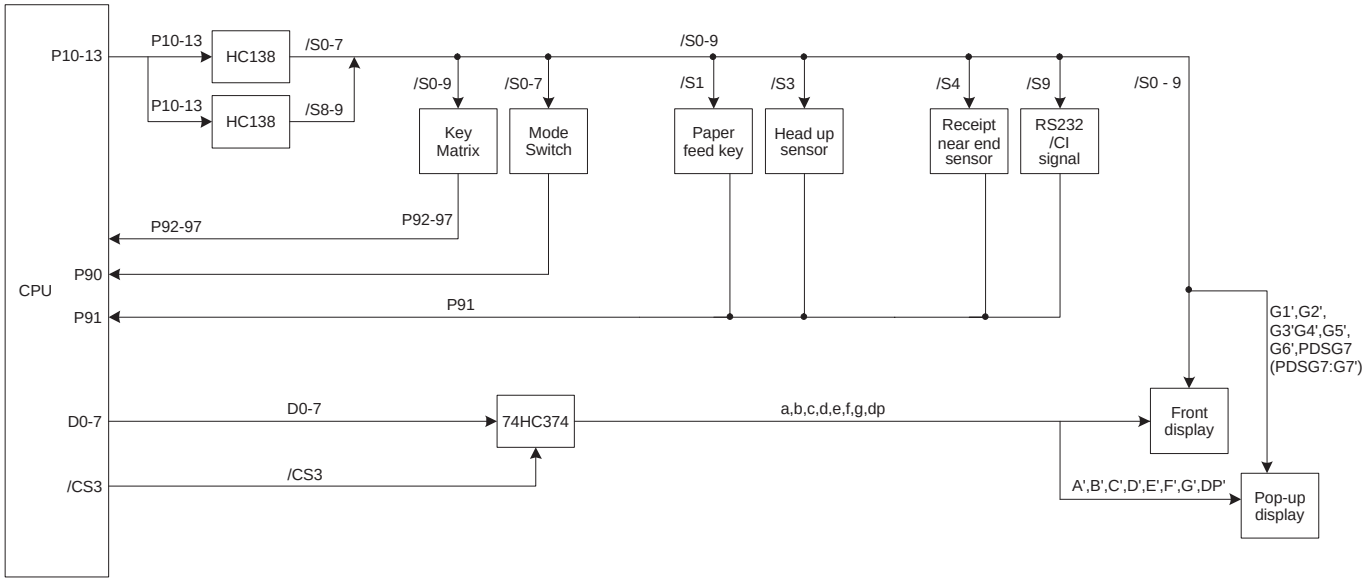
When the P60 signal from the CPU is HIGH, Q9 is turned on to operate the solenoid.

10. Buzzer drive circuit



When the BUZ1 signal from the CPU is HIGH, Q6 is turned on to operate the buzzer.

11. Keyboard circuit



Four P10-13 signals from the CPU are converted into 16 strobe signals by two 74HC138 for use in various functions.

1) Keyboard

Scan signal : 10 /S0-9 signals

Return signal : 6 P92-97 signals

The keys are read by the key matrix following the above signals.

2) Mode switch

Scan signal : 8 /S0-7 signals

Return signal : 1 P90 signal

The positions are read by the above signals.

Scan signal	/S0	/S1	/S2	/S3	/S4	/S5	/S6	/S7
Mode switch position	SRV	PGM	(OFF)	TIME	REG	MGR	X1/Z1	X2/Z2

3) Paper feed key

Scan signal : 1 /S1 signal

Return signal : 1 P91 signal

The paper feed key is read by the above signals.

4) Head up sensor

Scan signal : 1 /S3 signal

Return signal : 1 P91 signal

The Head up sensor state is read by the above signals.

Head up sensor	Head up detected	Head up not detected
P91	Low	High

5) Receipt near end sensor

Scan signal : 1 /S4 signal

Return signal : 1 P91 signal

The receipt near end sensor state is read by the above signals.

Receipt near end sensor	Near end detected	Near end not detected
P91	Low	High

6) RS232/CI signal detection

Scan signal : 1 /S9 signal

Return signal : 1 P91 signal

The RS232/CI signal is detected by the above signals.

RS232 /CI signal	/CI signal detected	/CI signal not detected (+5V output)
P91	Low	High

7) Display

Scan signal : 10 /S0-9 signals

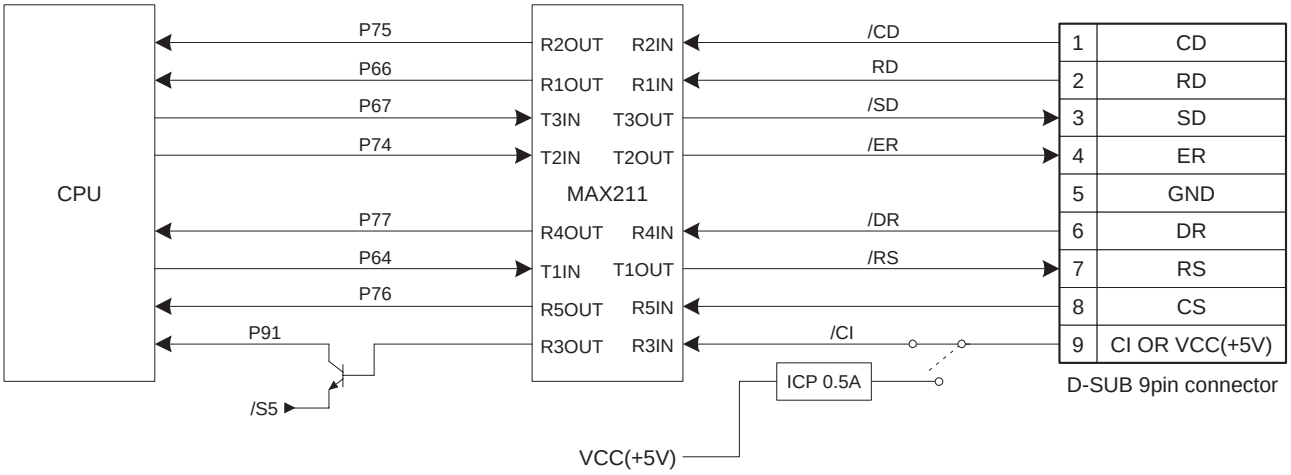
The above 10 scan signals are used as the following digit signals.

Digit signal :

Scan signal	/S0	/S1	/S2	/S3	/S4	/S5	/S6	/S7	/S8	/S9
Digit signal: Front	G1'	G2'	G3'	G4'	G5'	G6'	G7'	G8'	G9'	G10'
Digit signal: Pop-up	G1'	G2'	G3'	G4'	G5'	G6'	G7'			

Segment signal : Segment signals: a, b, c, d, e, f, g, and DP are output by the IC:74HC374, using the data bus signal:D0-7 from the CPU as an input signal and the chip select signal:/CS3 as a latch signal.

12. RS232 circuit

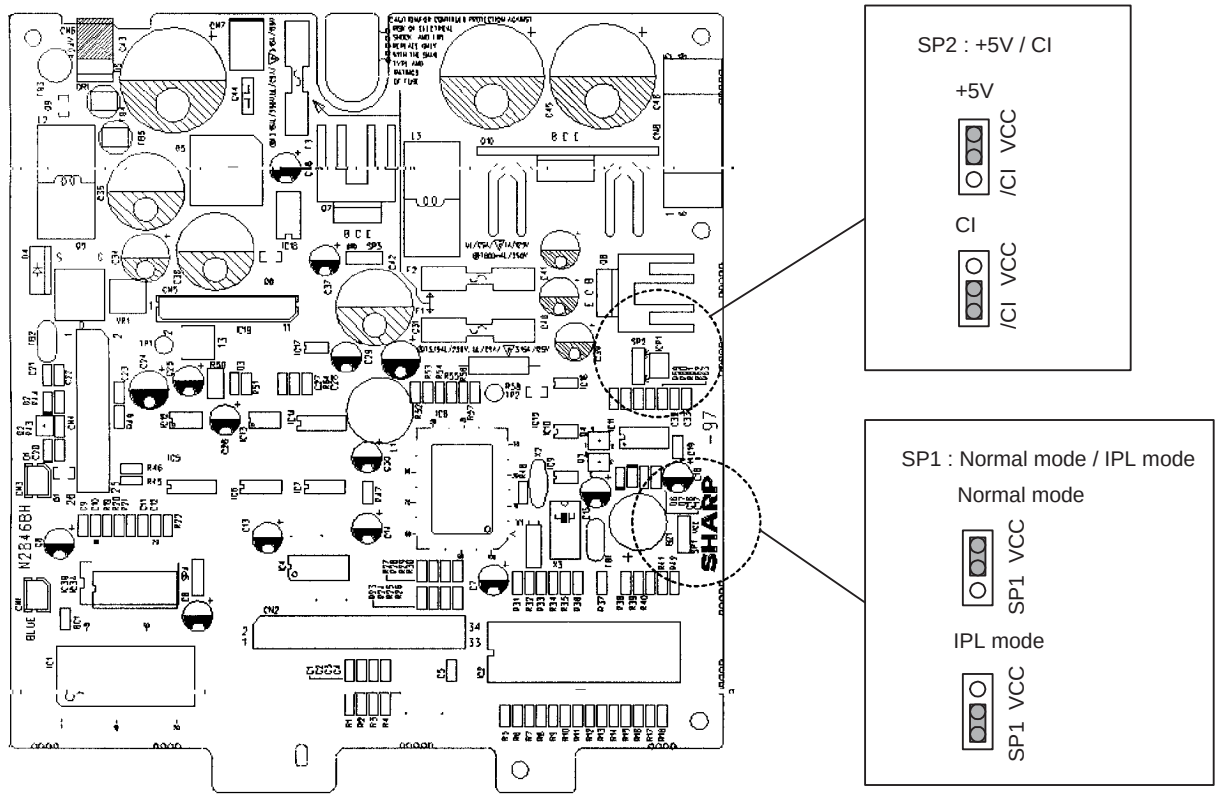


The signals from the CPU are converted by the MAX211 into the RS232 level to input and output them.
The CI signal allows the output of VCC(+5V) by switching.

13. SHORT PIN setting

The ER-A220 has two SHORT PIN settings.

SHORT PIN No.	FUNCTION	DEFAULT
SP1	Switching between Normal mode/IPL mode	Normal mode
SP2	Switching RS232C No.9 pin and CI/+5V	CI signal



CHAPTER 5. TEST FUNCTION

1. General

1) This diagnostic program has been developed for diagnosing machine functions in the field. The program is contained within the ER-A220.
   The diagnostic program is stored in the CPU internal Flash memory which will be executed by the CPU (M30624FGFP) which requires the following diagnostic operations :
   a) Proper power supply voltages are mandatory for logic circuits (+5V, VDD, POFF, +24V, 5.7V, 7.7V).
   b) CPU input/output pins, CPU internal logic, system bus and RAM must be working properly.

2. Operational procedure

To start the diagnostic program, you must enter the following command.
3-digit test item number →key in the SRV mode

The RAM must be operating properly to go into this mode. This is necessary because the control jumps to the program area in the SRV mode. A master reset must be performed before operating the ECR for the first time. After any option is installed, a program reset is required. When the master reset or program reset is performed, be sure to check the printout on the journal paper.

Master reset : Turn power on in the SRV' mode and change it to the SRV mode with the PAPER FEED key pressed.

print : MASTER RESET ***

Program reset : Turn power on in the SRV' mode and change it to the SRV mode.

print : PRG. RESET ***

3. Test command list

With the SRV mode and the following test code entry, the test start.

CODE	DESCRIPTION
100	Display & Buzzer test
101	Key code test
102	Printer test
104	Keyboard test
105	Mode switch test
106	Printer sensor test
110	Drawer open test
120	External RAM test
121	CPU internal RAM test
130	CPU internal ROM test
140	CPU internal Flash ROM test
500	RS-232 loop back test
550	Sleep mode test

4. Test contents

[1] Display & Buzzer test

1) Key operation

100 → #/TM/ST

2) Functional description

Display the following message on the front and the rear display boards.

- Front display

1. 2. 3. 4. 5. 6. 7. 8. 9. 0.

- Pop-up display

4. 5. 6. 7. 8. 9. 0.

A decimal point shifts from lower number of digit by one digit (per 200m sec.).

Next, display the following segments (for approx. 1 sec.).

- Front display

8. 8. 8. 8. 8. 8. 8. 8. 8. 8.

- Pop-up display

8. 8. 8. 8. 8. 8. 8.

Repeat the above two kinds of displays.
Sound a buzzer continuously during test.

3) Check items

a) The display must be correctly shown at each position.
b) The luminosity of displays must be uniform and even at each position.
c) Abnormal buzzer sound is not allowed.

4) Test termination

Press any key. The test terminates with the test and message printed

100

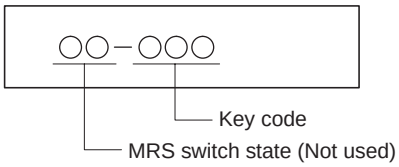
[2] Key code test

1) Key operation

101 → #/TM/ST

2) Functional description

Key code, MRS switch (not used in ER-A220) state and Cashier code are displayed.



3) Check items

a) Key code

HARDWARE CODE" of the following keys will be displayed ever time the keys are pressed.
"---" indicates that a key is struck twice and also that input data is not accepted.

[KEY POSITION CODE]

<ALL KEY>

↑	148	132						
144	147	131						
145	146	130						
115	099	083	067	051	035	019	003	
116	100	084	068	052	036	020	004	
114	098	082	066	050	034	018	002	
117	101	085	069	053	037	021	005	
113	097	081	065	049	033	017	001	
117	096	080	064	048	032	016	000	

<ER-A220 STANDARD KEY BOARD LAYOUT>

↑	148	132						
144	147	131						
145	146	130						
			051		035	019	003	
116	100	084	068	052	036	020	004	
114	098	082	066	050	034	002		
117	101	085	069	053	037	005		
113	097	081	065	049	033	001		
096		080	064	048	032	000		

4) Test termination

Change the mode switch position other than SRV position to terminate the test.

The test terminates with the test and message printed

1 0 1

[3] R/J printer test

1) Key operation

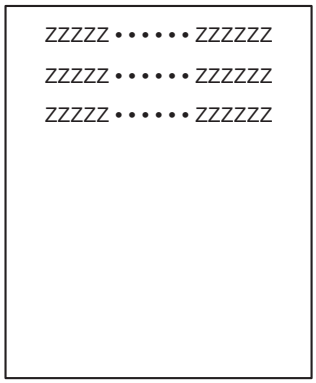
102 → #/TM/ST

2) Functional description

Display the following message.

1 2 3 4 5 6 7 8 9 0

Print the following characters.



3 lines of Z(30 characters) are printed

3) Check items

a) Printed characters must be free of stain and blur.

4) Test termination

This check is terminated automatically.

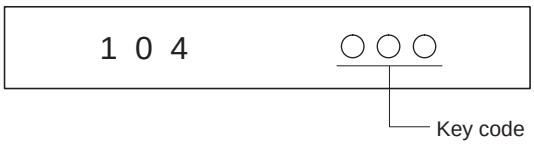
[4] Keyboard test

1) Key operation

3383 104 → #/TM/ST
Sumcheck data

Standard keyboard layout sumcheck data	
ER-A220	3383

2) Functional description



Keyboard test is performed with the sumcheck data of key code.
For sumcheck data, data are inputted to the upper four digits befor the diagnostics code.
The data are compared with the added data which are added until the final key (TL) is pressed. if the data agree with the added data, the end print is made. If not, the error print is made.
The sumcheck data is obtained by totalizing all key hardware codes.

[ALL KEY LAYOUT]

<ALL KEY>

↑	148	132					
144	147	131					
145	146	130					
115	099	083	067	051	035	019	003
116	100	084	068	052	036	020	004
114	098	082	066	050	034	018	002
117	101	085	069	053	037	021	005
113	097	081	065	049	033	017	001
117	096	080	064	048	032	016	000

<ER-A220 STANDARD KEY BOARD LAYOUT>
SUMCHECK DATA = 148 + 132 + 144 + 147 + ····· = 3383

↑	148	132					
144	147	131					
145	146	130					
			051		035	019	003
116	100	084	068	052	036	020	004
114	098	082	066	050	034	002	
117	101	085	069	053	037	005	
113	097	081	065	049	033	001	
096		080	064	048	032	000	

Display the following message on the front display.

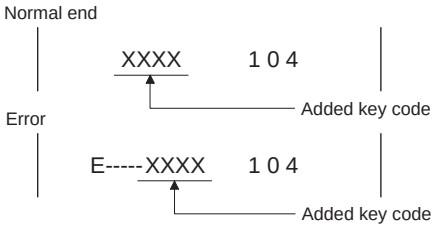
3) Check items

a) Check of the display in the test and the content of end print.

4) Test termination

This check is terminated automatically.

The test terminates with the test and message printed



[5] Mode switch test

1) Key operation

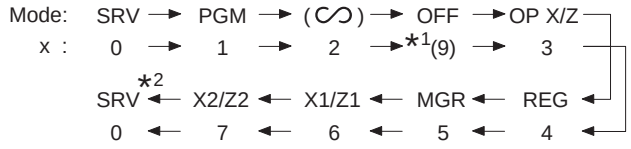
105 → #/TM/ST

2) Functional description

Display the following message on the front display.

1 0 5 X

When the Mode Switch is switched over in the following order, a numerical value corresponding to each position of mode switch is displayed at X.



∗1 In the OFF mode, the number 9 appears momentarily and then the power turns off.

∗2 Turn the mode switch from the X2/Z2 mode to the SRV mode to finish the test.

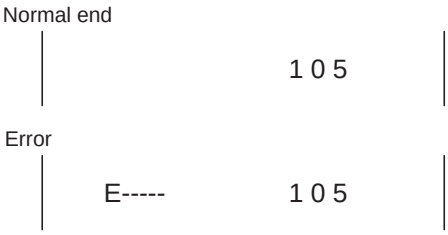
The number x should be read in correct order. (When the contacts are open, the number 9 is displayed.)

3) Check items

a) Check of the display in the test and the content of end print.

4) Test termination

The test terminates with the test and message printed



[6] Printer sensor test

1) Key operation

106 → #/TM/ST

2) Functional description

State of the paper near end sensor is sensed and displayed.

1 0 6 X

3) Check items

	Displayed	Description
X	C	paper : existed
	O	paper : Not existed

4) Test termination

Press any key. The test terminates with the test and message printed

1 0 6

[7] Drawer open test (For standard test)

1) Key operation

110 → #/TM/ST

2) Functional description

State of the drawer open sensor is sensed and displayed.

```
1 1 0          X
```

3) Check items

X	Description
O	Drawer open sensor detected. (Drawer opend)
C	Drawer open sensor not detected. (Drawer closed)

∗ The ER-A220 is not provided with the open sensor and thus the letter "C" stays on the display.

a) Check opening of the specified drawer.

4) Test termination

Press any key. The test terminates with the test and message printed

```
1 1 0
```

[8] External RAM test

1) Key operation

120 → #/TM/ST

2) Functional description

Perform the following check for the external RAM 128 KByte SRAM.

Perform the following processes for memory address to be checked (080000H~27FFFH).

PASS1 : Save memory data.

PASS2 : Write data "00H."

PASS3 : Read and compare data "00H," write data "55H."

PASS4 : Read and compare data "55H," write data "AAH."

PASS5 : Read and compare data "AAH."

PASS6 : Restore the memory data.

If a compare error occurs in the check sequence PASS1-PASS6, an error print is made. If no error occurs through all address, the check ends normally.

The following address check is performed further.

Check point address =

10000H , 10001H , 10002H , 10004H , 10008H
10010H , 10020H , 10040H , 10080H ,
10100H , 10200H , 10400H , 10800H ,
11000H , 12000H , 14000H , 18000H ,
20000H

3) Check the following items:

Check the termination printout.

4) Test termination

The test terminates after printing the termination printout.

Termination printout:

Normal termination		120
Abnormal termination	Ex – – – – –	120 ∗∗∗∗∗

X = 1: Data check error
2: Address check error

Note: When an error occurs, the error print is performed and the check is terminated. The error occurrence address is shown in hexadecimal at positions shown with ∗∗∗∗∗.

[9] CPU internal RAM test

1) Key operation

121 → #/TM/ST

2) Functional description

Perform the following check for the CPU internal RAM 20 KByte.

Perform the following processes for memory address to be checked (00400H~053FFH).

PASS1 : Save memory data.

PASS2 : Write data "00H."

PASS3 : Read and compare data "00H," write data "55H."

PASS4 : Read and compare data "55H," write data "AAH."

PASS5 : Read and compare data "AAH."

PASS6 : Restore the memory data.

If a compare error occurs in the check sequence PASS1-PASS6, an error print is made. If no error occurs through all address, the check ends normally. The following address check is performed further.

Check point address =

01000H , 01001H , 01002H , 01004H , 01008H
01010H , 01020H , 01040H , 01080H ,
01100H , 01200H , 01400H , 01800H ,
02000H , 04000HE

3) Check the following items :

Check the termination printout.

4) Test termination

The test terminates after printing the termination printout.

Termination printout:

Normal termination		121
Abnormal termination	Ex – – ~ – –	121 ∗∗∗∗∗

X = 1: Data check error
2: Address check error

Note : When an error occurs, the error print is performed and the check is terminated. The error occurrence address is shown in hexadecimal at positions shown with ∗∗∗∗∗.

[10] External ROM (IPL) test

1) Key operation

130 → #/TM/ST

2) Functional description

Sum check of the external ROM for IPL (40000H - 7FFFFH) is performed. If the lower two digits of SUM is 10H, it is normal.

7-SEGMENT DISPLAY: 1 3 0

3) Check the following items:

Check the printout after the test.

4) Test termination

The test automatically terminates with termination message.

Normal termination print		130
	ROM	27020✻✻✻✻✻ ✻✻✻✻✻
Error termination print	E – – ~ – –	130
	ROM	27020✻✻✻✻✻ ✻✻✻✻✻

Note: "✻✻✻✻✻" means the ROM version number.

[11] CPU internal FLASH ROM test

1) Key operation

140 → #/TM/ST

2) Functional description

Sum check of the ROM (C0000H - FFFFFH) is performed. If the lower two digits of SUM is 10H, it is normal.

3) Check the following items:

Check the printout after the test.

4) Test termination

The test automatically terminates with termination message.

Normal termination print		140
	ROM	27020✻✻✻✻✻ ✻✻✻✻✻
Error termination print	E – – – ~ – –	130
	ROM	27020✻✻✻✻✻ ✻✻✻✻✻

Note : "✻✻✻✻✻" means the ROM version number.

[12] RS-232 loop back test

Connect the loop back connector(UKOG-6705RCZZ) to RS232 connector.

1) Key operation

500 → #/TM/ST

2) Functional description

Control signal check

OUT PUT		INPUT			
/ER	/RS	/DR	/CI	/CD	/CS
OFF	OFF	OFF	OFF	OFF	OFF
OFF	ON	OFF	OFF	ON	ON
ON	OFF	ON	ON	OFF	OFF
ON	ON	ON	ON	ON	ON

Data communication check

Perform 256-byte branch loop back test between SD and RD.

DATA : $00 - $FF

BAUD RATE : 9600 BPS

Display :

5 0 0

3) Test termination

This check is terminated automatically.

The test terminates with the test and message printed

Normal end

RS TEST OK

Error

RS TEST ✻✻NG ✻✻ER XX

XX: Error code	Description
01	ER-DR error
02	ER-CI error
03	RS-CD error
04	RS-CS error
05	SD-RD error (DATA error)
06	SD-RD error (DATA error/Flaming error)

[13] SLEEP MODE test

1) Key operation

550 → #/TM/ST

2) Functional description

Check the state of SLEEP MODE (Numeric of display: OFF/Decimal point of display: ON)

And waiting for cancel of SLEEP MODE (Input the any key, Input the signal of RS232 port)

3) Check item

a) Check the state of SLEEP MODE: Numeric of display: OFF/Decimal point of display: ON

b) Cancel of SLEEP MODE by input the any key.

4) Test termination

This check is terminated automatically.

The test terminates with the test and message printed

5 5 0

CHAPTER 6. DOWN LOAD FUNCTION

1. General

RAM data can be transmitted in the following two methods.
Save the data before servicing as follows:

① ECR ⟷ ECR

- Cable : 9 pin D-SUB – 9 pin D-SUB

Fig. 1-1

② ECR ⟷ ER-02FD

- Cable : 9 pin D-SUB – 25 pin D-SUB

Fig. 1-2

2. SIO interface specification

1) Operation:	Simplex
2) Line configuration:	Direct connect
3) Data rate:	19200/9600(by programming)
4) Sync mode:	Asynchronous
5) Checking:	Vertical parity (odd)
6) Code:	7 bits (ASCII)
7) Bit sequence:	LSB first
8) Line level:	RS232 level
9) Data forma:	

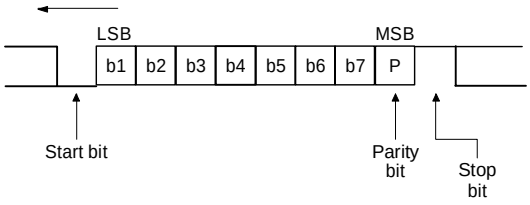
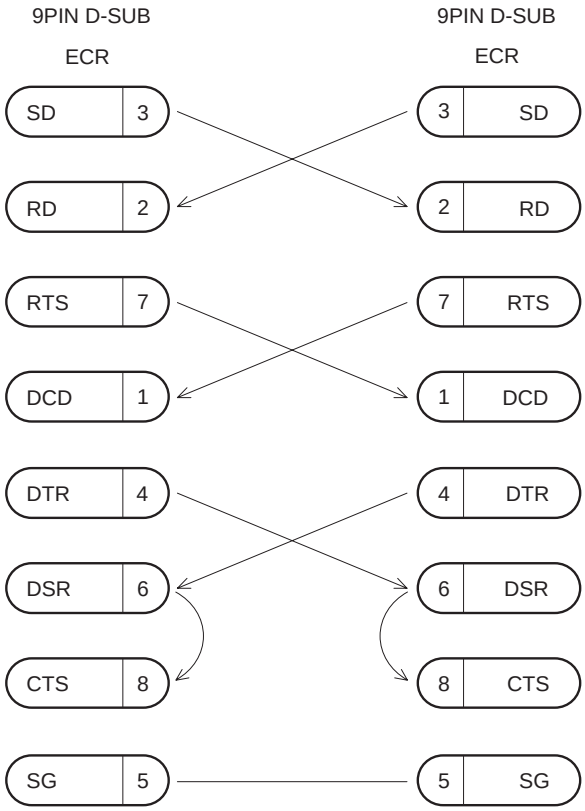


FIg. 2-1

3. Location of connector pins

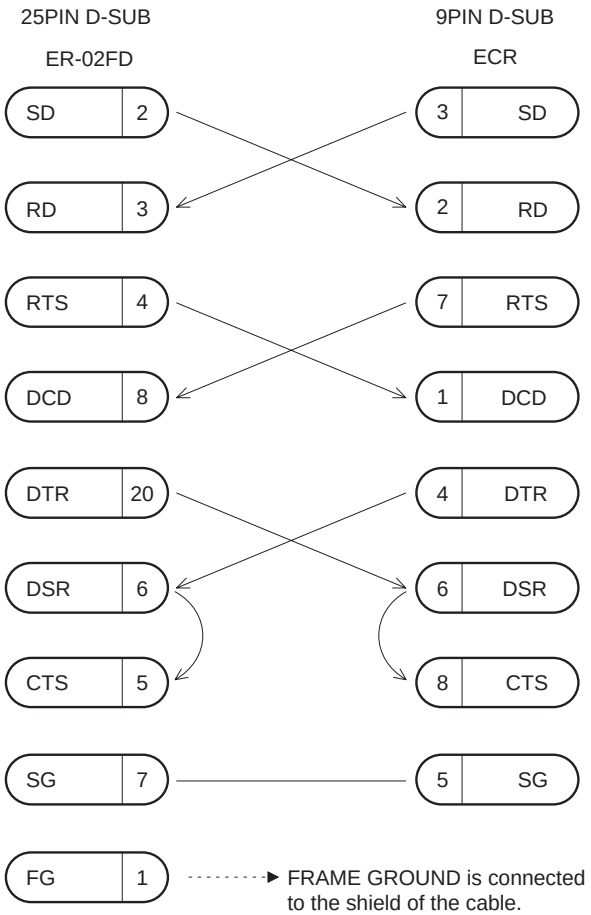
① ECR-ECR cable



SD : TRANSMITTED DATA
RD : RECEIVED DATA
DTR: DATA TERMINAL READY
DSR: DATA SET READY
RTS: REQUEST TO SEND
DCD: DATA CARRIER DETECTOR
CTS: CLEAR TO SEND

Fig. 3-1

② ECR-ER-02FD cable



SD : TRANSMITTED DATA
RD : RECEIVED DATA
DTR: DATA TERMINAL READY
DSR: DATA SET READY
RTS: REQUEST TO SEND
DCD: DATA CARRIER DETECTOR
CTS: CLEAR TO SEND
FG : FRAME GROUND

Fig. 3-2

Interfacing signals

Pin No.	Signal name	In/Out	On level	Description
1	GND	—	—	Signal ground
2	$\overline{ER}$	Out	Low	Equipment ready
3	$\overline{DR}$	In	Low	Data set ready
4	RXD	In	High: MARK Low: SPACE	Receive data
5	TXD	Out	High: MARK Low: SPACE	Transmit data
6	$\overline{CD}$	In	Low	Carrier detect
7	$\overline{RR}$	Out	Low	Ready to receive
8	$\overline{CS}$	In	Low	Clear to send
9	$\overline{RS}$	Out	Low	Request to send

4. Application specification

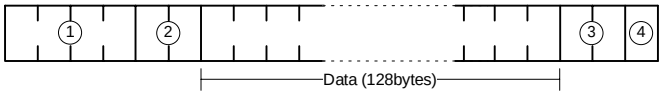
The following service (SRV) modes are available for the serial data transfer of the ECR

1) Data transmit (Source side)

2) Data receive (Target)

5. Data format

A single byte image of the RAM data to be transmitted is divided into a high order 4 bits and low order 4 bits and converted into ASCII code. Then, the image of the memory is sent in the following format:



① Memory top address: 0000H ~ FFFFH
Top address of the memory to be transmitted in ASCII number.

② Page : 00 ~ 02
Page of the memory to be transmitted in ASCII number.

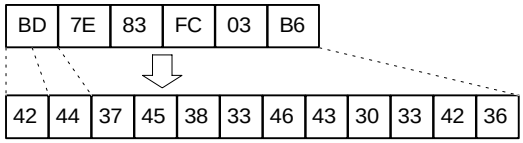
③ Sum check

④ End code : Hex 0D

NOTE : In order that contents of RAM memory may not over-ride pages for this job, RAM image is sent in unit of 64 bytes from the address 0000. In other words, 128 bytes are sent at one time on the transmit data format.

RAM DATA FORMAT

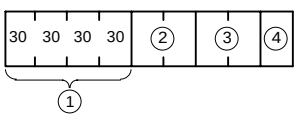
Exhibit :



Code table

HEX	ASCII	Character	HEX	ASCII	Character
0	30	0	8	38	8
1	31	1	9	39	9
2	32	2	A	41	A
3	33	3	B	42	B
4	34	4	C	43	C
5	35	5	D	44	D
6	36	6	E	45	E
7	37	7	F	46	F

6. END record



① End message: Fixed to 30303030.

② End massage: Fixed to 4646.

③ Sum check

④ End code: CR (0D)

7. Operational method

1) To prepare an ECR to receive data from another ECR or the ER-02FD, the memory size of the receiving unit must the same as or greater than the sending unit.
2) Master reset the receiving ECR.
3) Connect loader cable between ECRs.
4) Set the receiving ECR ready to receive.

[#/TM/ST] → 96 → [Ⓧ] → [TL/NS]

5) Start the sending ECR.

[#/TM/ST] → 98 → [Ⓧ] → [TL/NS]

6) Transmission status.

   Description of error status

   1 : Application error (Command error)
   2 : Application error (Parity error)
   3 : Application error (Check sum error)
   4 : Application error (Data size error)
   5 : Hard ware error
   6 : Power off error
   7 : Time out error
   8 : DSR off error(when data transmission starts)
  11 : Application error (Transmit data size error)
  12 : Application error (Block sequence error)
  15 : Application error (different model error)

7) Service reset the receiving ECR.

8. Saving/Loading of data to/From the FD unit Configuration

1) Turn off the power switch of the ER-02FD, and set the DIP switches of the FD unit as follows:

ER-02FD (The ER-01FD functions of the ER-02FD are used.)

DS-1								DS-2			
1	2	3	4	5	6	7	8	1	2	3	4
OFF	ON	OFF	ON	OFF	OFF	OFF	ON	X	ON	OFF	OFF

Data rate

4	6	Rate [bps]
OFF	OFF	19200
ON	OFF	9600

Disk format
CCP/M: OFF
PC-DOS: ON

2) Connect the cable.

Saving data

1) Turn on the power switch and insert a floppy disk which has been formatted.
2) Start the SEND JOB on the ECR side as follows:

[#/TM/ST] → 96 → [Ⓧ] → [TL/NS]

3) Data transmission is started and the green lamp on the ER-02FD blinks.

Loading data

1) Turn on the power switch and insert the floppy disk which stores the data.
2) Start the RECEIVE JOB on the ECR side as follows:

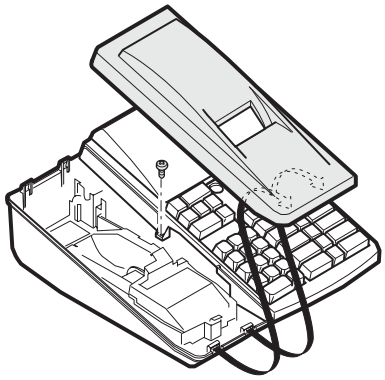
[#/TM/ST] → 98 → [Ⓧ] → [TL/NS]

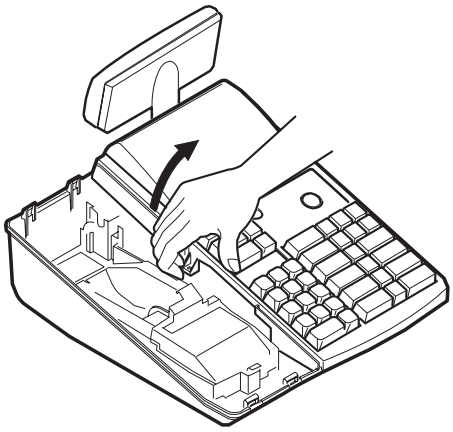
3) Press the [SEND] key on the FD unit.
4) Data transmission is started and the Green lamp on the ER-02FD blinks.
5) Service reset the ECR.

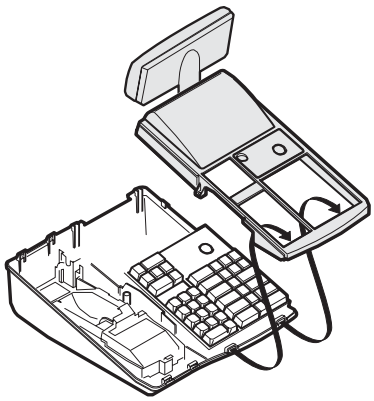
CHAPTER 7. SERVICE PRECAUTION

1. Cautions to be taken when removing the upper cabinet

When removing the upper cabinet, first remove the printer cover and then remove the upper cabinet from the let side, as shown in the sketch below.





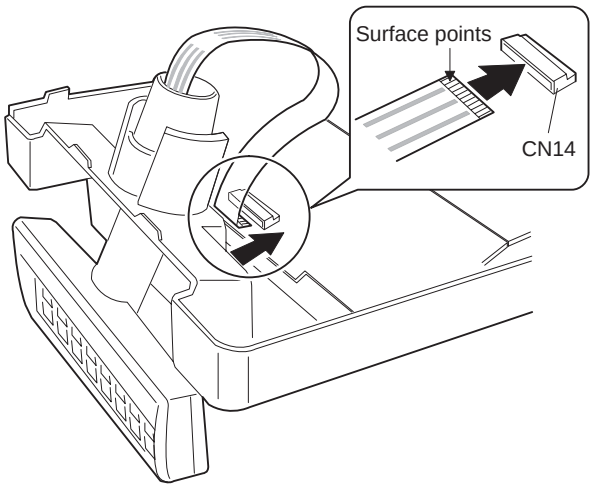


2. Cautions to be taken when installing the pop-up display connector cable

Exercise care not to have the wrong direction of the pop-up display connector cable when connecting the cable to the Key I/F connector CN14.

When connecting the cable, make sure:

- The cable is not kinked.
- The cable contact surface points upward against the PWB when inserting the cable.



CHAPTER 8. IPL (Initial Program Loading) FUNCTION

The application program of the ER-A220 is written on the CPU internal FLASH ROM.
When servicing the unit, it is necessary to write the application program on the CPU internal FLASH ROM.

- When the CPU is changed :

  The following CPUs delivered as service parts do not have the application program written on them.

PARTS NAME	PARTS CODE	LOCATION No.
CPU	VHi30624FG001	IC8

- When the application program is changed, such as when the version is updated.

  Use the MASTER ROM (EP-ROM : 256 kbyte) to write the application program.

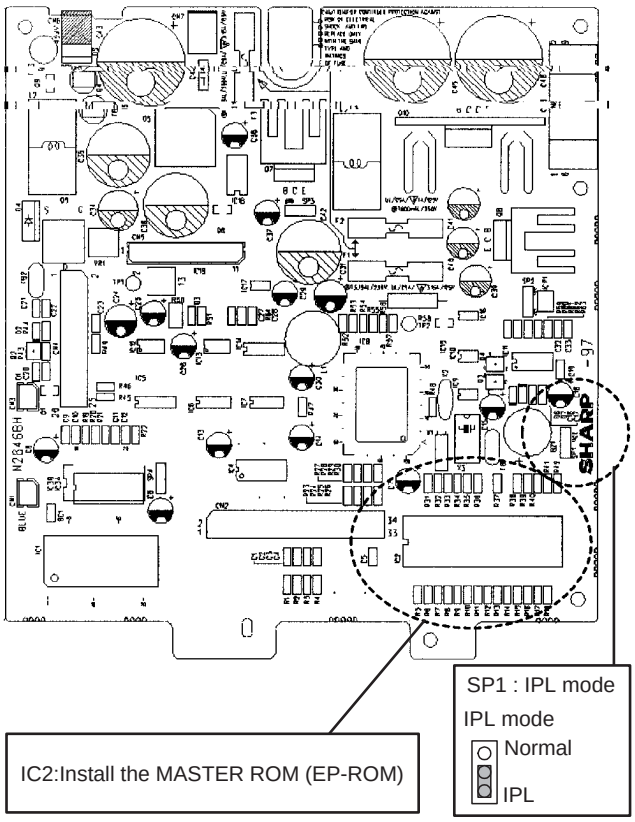
PARTS NAME	PARTS CODE	LOCATION No.
MASTER ROM	VHi2720RBD1A	Attach to the IC socket of IC2.

IPL operating procedure

① Power off the ECR.

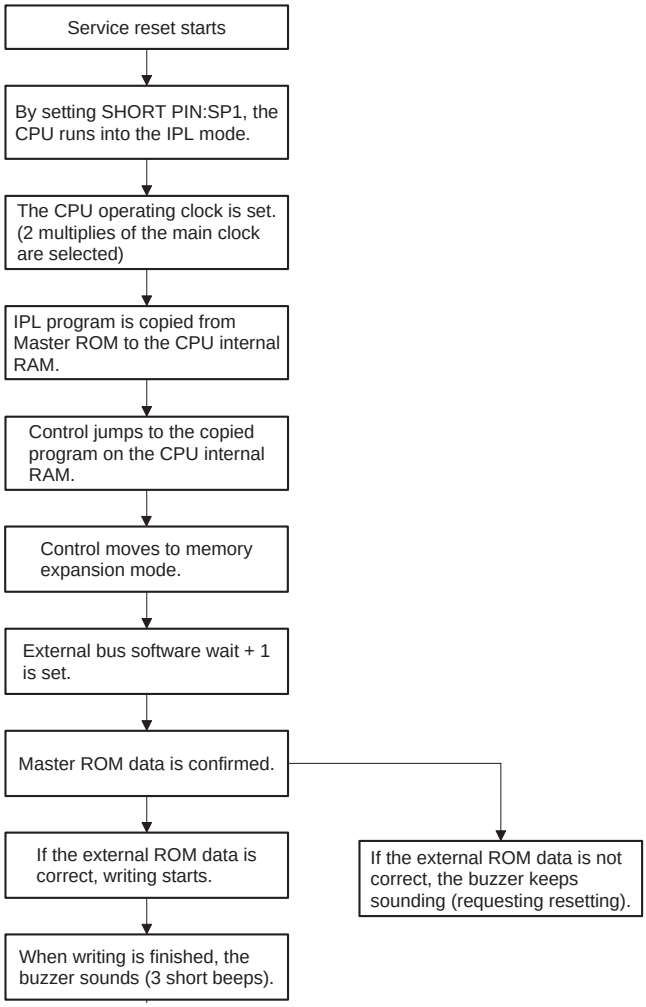
② Set the short pin : SP1 to the IPL mode on the main PWB

③ Install the MASTER ROM (EP-ROM) to the IC SOCKET : IC2 on the main PWB



④ Power on the ECR.

⑤ Enter the Service rest.
(Turn the Mode switch from SRV' to SRV position.)


Service reset starts
By setting SHORT PIN:SP1, the CPU runs into the IPL mode.
The CPU operating clock is set. (2 multiplies of the main clock are selected)
IPL program is copied from Master ROM to the CPU internal RAM.
Control jumps to the copied program on the CPU internal RAM.
Control moves to memory expansion mode.
External bus software wait + 1 is set.
Master ROM data is confirmed.
If the external ROM data is correct, writing starts.
When writing is finished, the buzzer sounds (3 short beeps).
If the external ROM data is not correct, the buzzer keeps sounding (requesting resetting).

⑥ When writing is finished, power off the ECR.

⑦ Return the short pin:SP1 to the Normal mode.

⑧ Remove the MASTER ROM (EP-ROM) from the IC socket:IC2.

⑨ Power on the ECR.

⑩ Master reset.
(While holding down PAPER FEED key, Mode switch turn to SRV' position to SRV position.)

CHAPTER 9. INSTALLATION OF OPTIONS

1. REMOTE DRAWER: ER-05DW/06DW

CAUTION

Before turning the mode switch from the (SRV') to (SRV), make sure the AC power cord is connected to the wall outlet; otherwise, the data on memory might be destroyed.

1-1. Outline

The ER-A220 allows connection of one remote drawer ER-05DW/06DW.

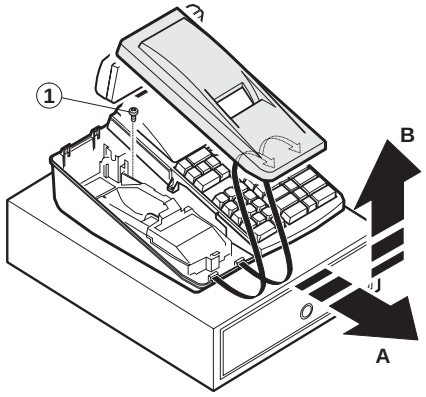
1-2. Installation procedure

1) Separating standard drawer

① Remove the printer cover.

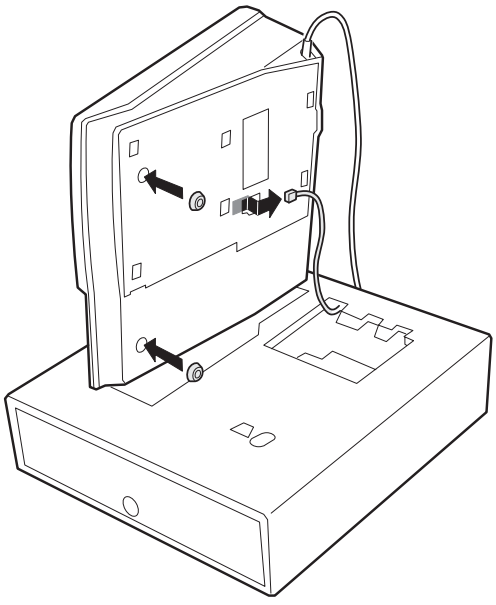
② Remove the screws ① securing the drawer.

③ Pull the unit the direction indicated by the arrow and lift it up in the direction of B.



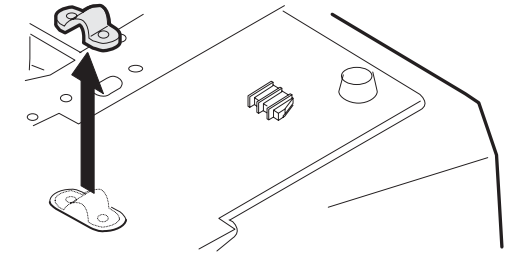
④ Put the drawer upright at the left side of the unit and remove the drawer connector.

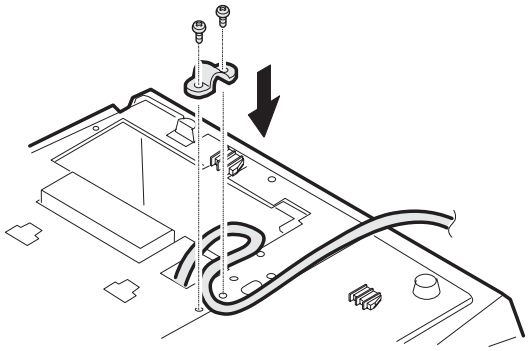
2) Affix two rubber legs (GLEGG6659BHZZ) to the front part of the lower cabinet.



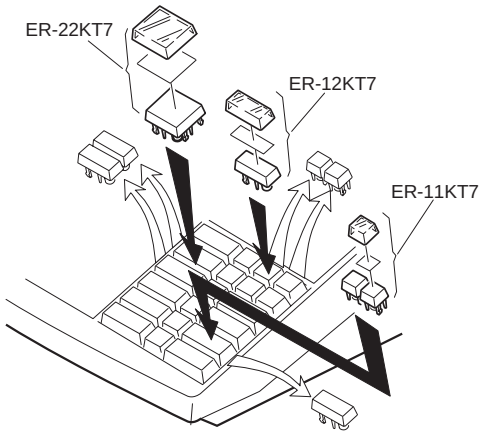
3) Connect the remote drawer cable to the drawer connector on the main PWB. (Location: CN10)

4) Use nippers to cut off drawer cable binding holder on the bottom cabinet, and bind drawer cable. Screw used in this case is an accessory of the DRAWER UNIT.

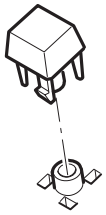




2. KEY TOP KIT: ER-11KT7/12KT7/22KT7 DUMMY KEY KIT: ER-11DK7G/15DK7G

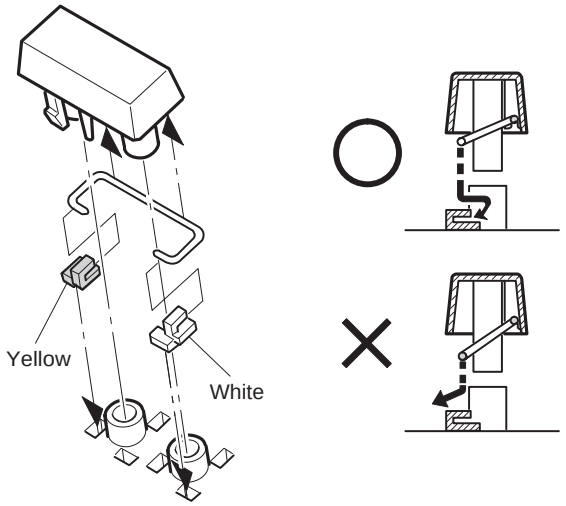


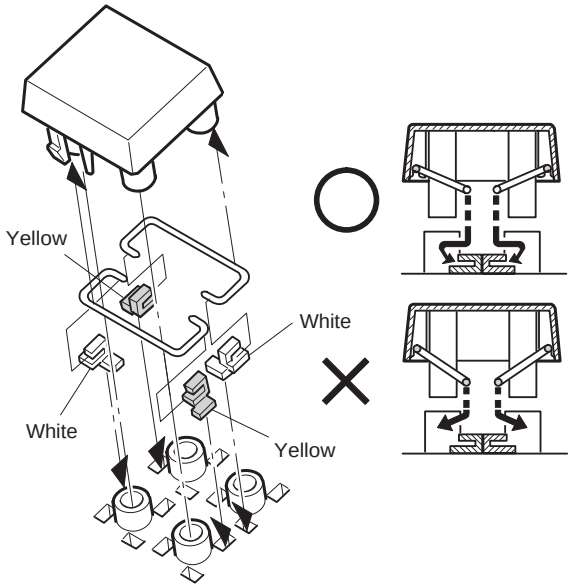
2-1. ER-11KT7



2-2. ER-12KT7, ER-22KT7

1) Attach two spacers to the keyboard frame.





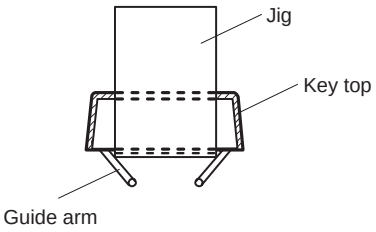
- Attach the yellow spacer to the left lower side, and the white spacer to the right lower side.

2) The key top of the ER-12KT7 and the ER-22KT7 includes the guide pin. Install the key top so that the guide pin is engaged with the spacer attached to the keyboard frame.

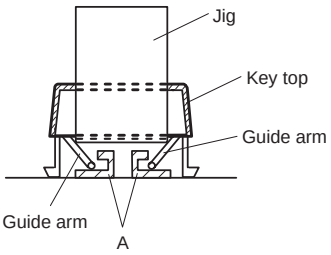
(When using 2 x 2 key top installing jig (UKOG-6725BHZZ) for installation)

1) Remove the key label and the key cap from the key top.

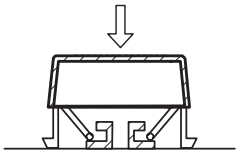
2) Attach the key top so that the guide arm is under the jig.



3) With the jig inserted in the key top, slowly press down the key top until the guide arm is brought into contact with the guide holder A.



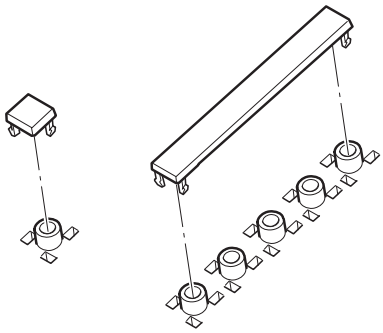
4) Remove the jig under the above condition 3), and press the key top.



5) Check that the key top operates properly.

6) Install the key label and the key cap.

2-3. ER-11DK7G, ER-51DK7G



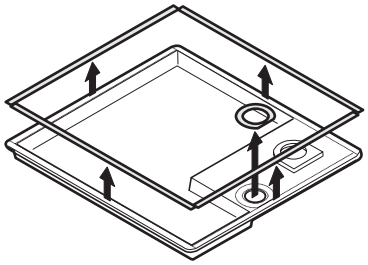
3. DRIP-PROOF KEYBOARD COVER (GCOVH2486BHZZ)

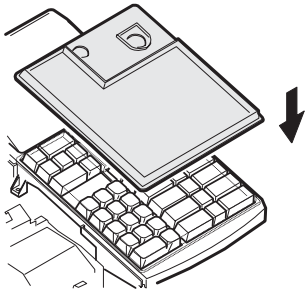
3-1. Outline

This cover protects both the keyboard and the mode switch from water and others.

3-2. Installation procedure

1) Remove the double-coated tape and affix.

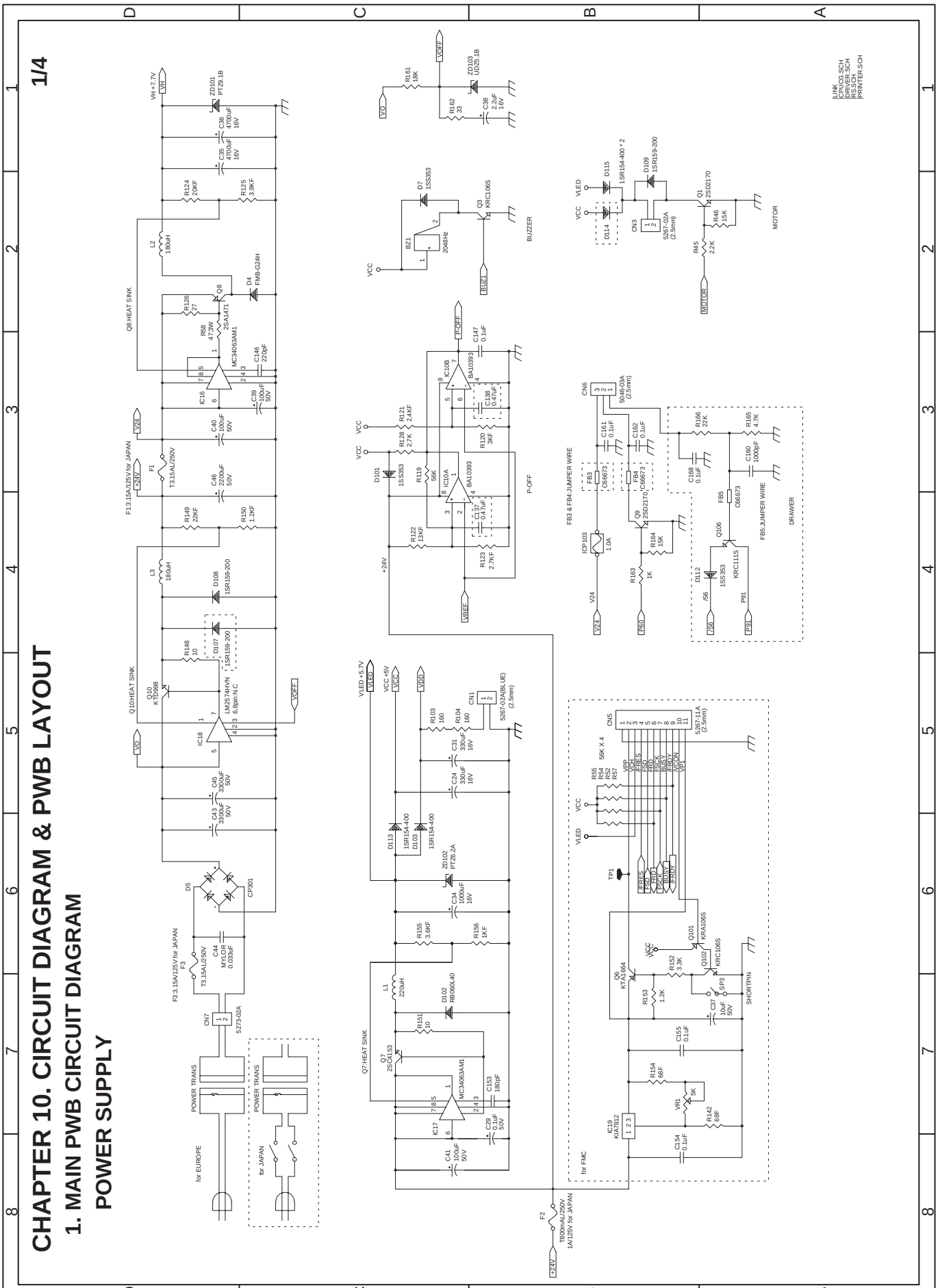


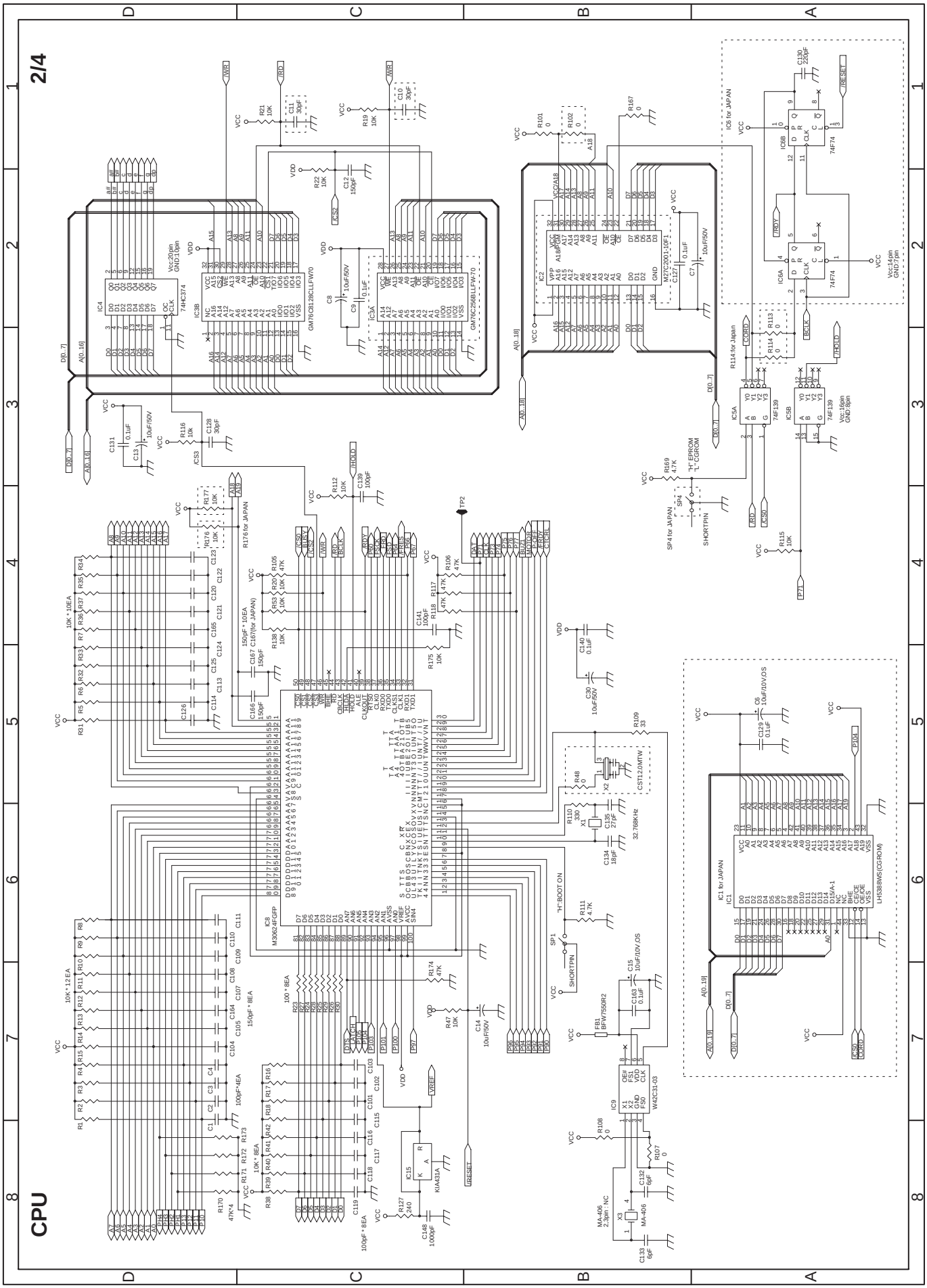


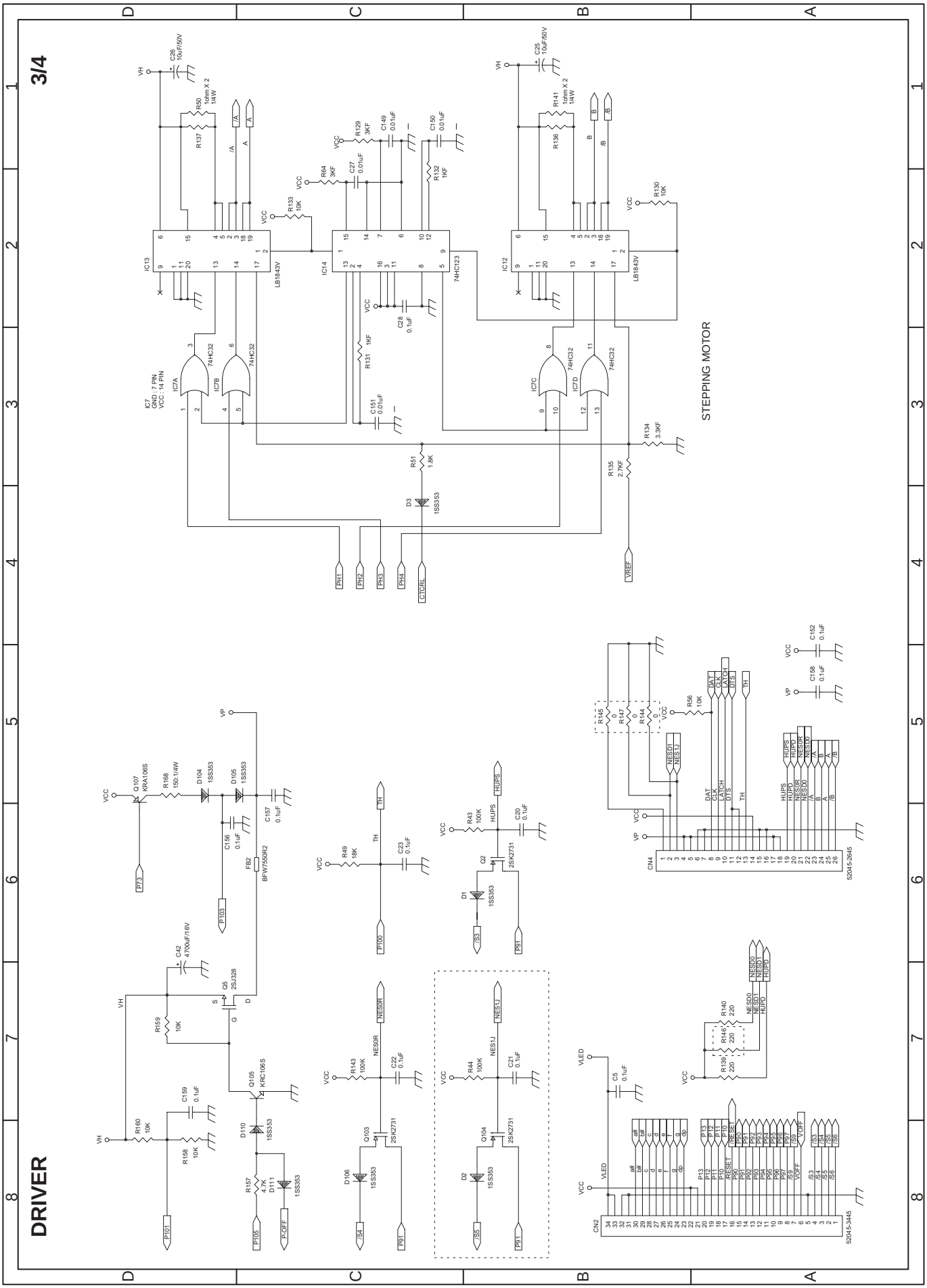
CHAPTER 10. CIRCUIT DIAGRAM & PWB LAYOUT

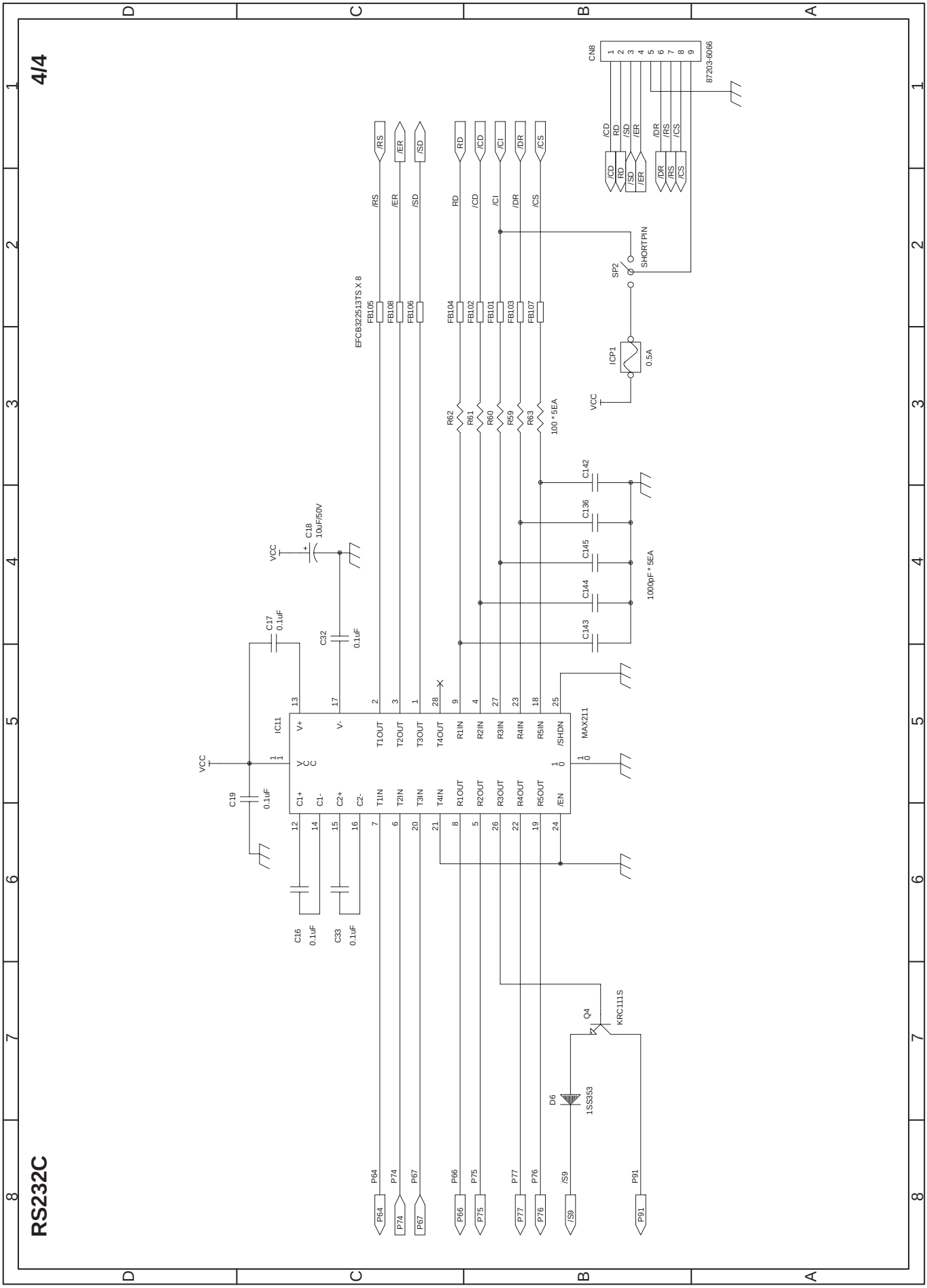
1. MAIN PWB CIRCUIT DIAGRAM

POWER SUPPLY

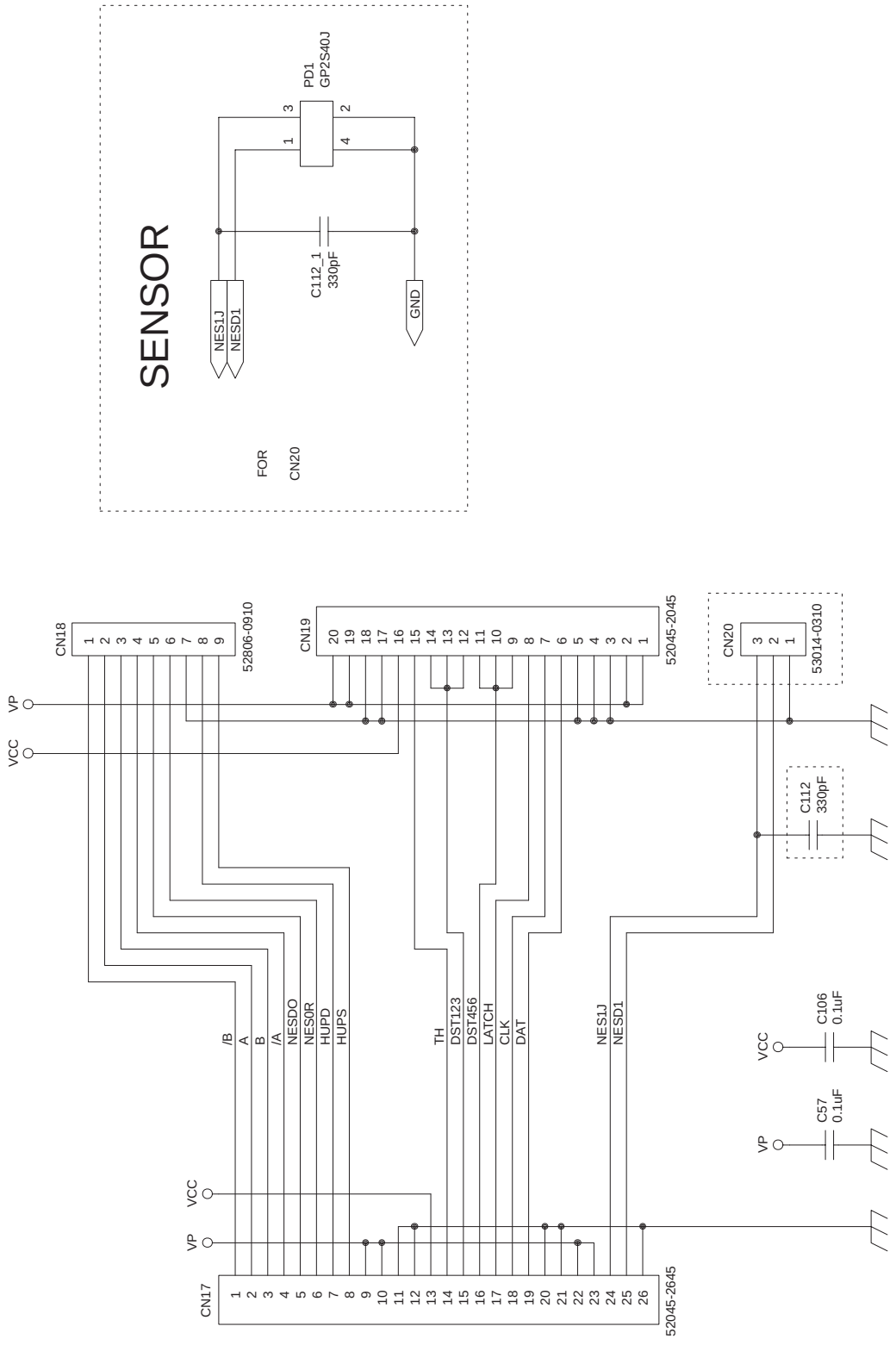



2/4
CPU


3/4
STEPPING MOTOR
DRIVER
IC13
LB1843V
IC14
74HC123
IC12
LB1843V
IC7
GND : 7 PIN
VCC : 14 PIN
IC7A
IC7B
IC7C
IC7D
74HC32
VH
VCC
VP
VLED
VREF
C26 10uF/50V
C25 10uF/50V
R50 10ohm X 2 1/4W
R141 10ohm X 2 1/4W
R137
R136
R64 3KF
R129 3KF
C27 0.01uF
C149 0.01uF
C150 0.01uF
R132 1KF
R133 10K
R130 10K
R131 1KF
C28 0.1uF
C151 0.01uF
R51 1.8K
D3 1SS353
R134 3.3KF
R135 2.7KF
PH1
PH2
PH3
PH4
CTCRL
/A
A
B
/B
Q107 KRA106S
R168 150 1/4W
D104 1SS353
D105 1SS353
C157 0.1uF
C156 0.1uF
FB2 BFW7550R2
P73
P103
C42 4700uF/16V
Q5 2SJ328
R159 10K
R160 10K
C159 0.1uF
R158 10K
Q105 KRC106S
D110 1SS353
R157 4.7K
D111 1SS353
P101
P105
P-OFF
R49 18K
C23 0.1uF
TH
P100
R43 100K
C20 0.1uF
HUPS
Q2 2SK2731
D1 1SS353
7S3
P91
R143 100K
NES0R
C22 0.1uF
Q103 2SK2731
D106 1SS353
IS4
R44 100K
NES1U
C21 0.1uF
Q104 2SK2731
D2 1SS353
IS5
R145 0
R147 0
R144 0
R96 10K
NES1D
NES1U
NES0D
NES0R
DAT
CLK
LATCH
DTS
/A
B
/B
C152 0.1uF
C158 0.1uF
CN4
52045-2645
C5 0.1uF
R140 220
R146 220
R138 220
NES0D
NES0R
NES1D
NES1U
HUPD
CN2
52045-3445
P13
P12
P11
P10
RESET
P90
P91
P92
P93
P94
P95
P96
P97
VOFF
IS1
IS2
IS3
IS4
IS5
IS6

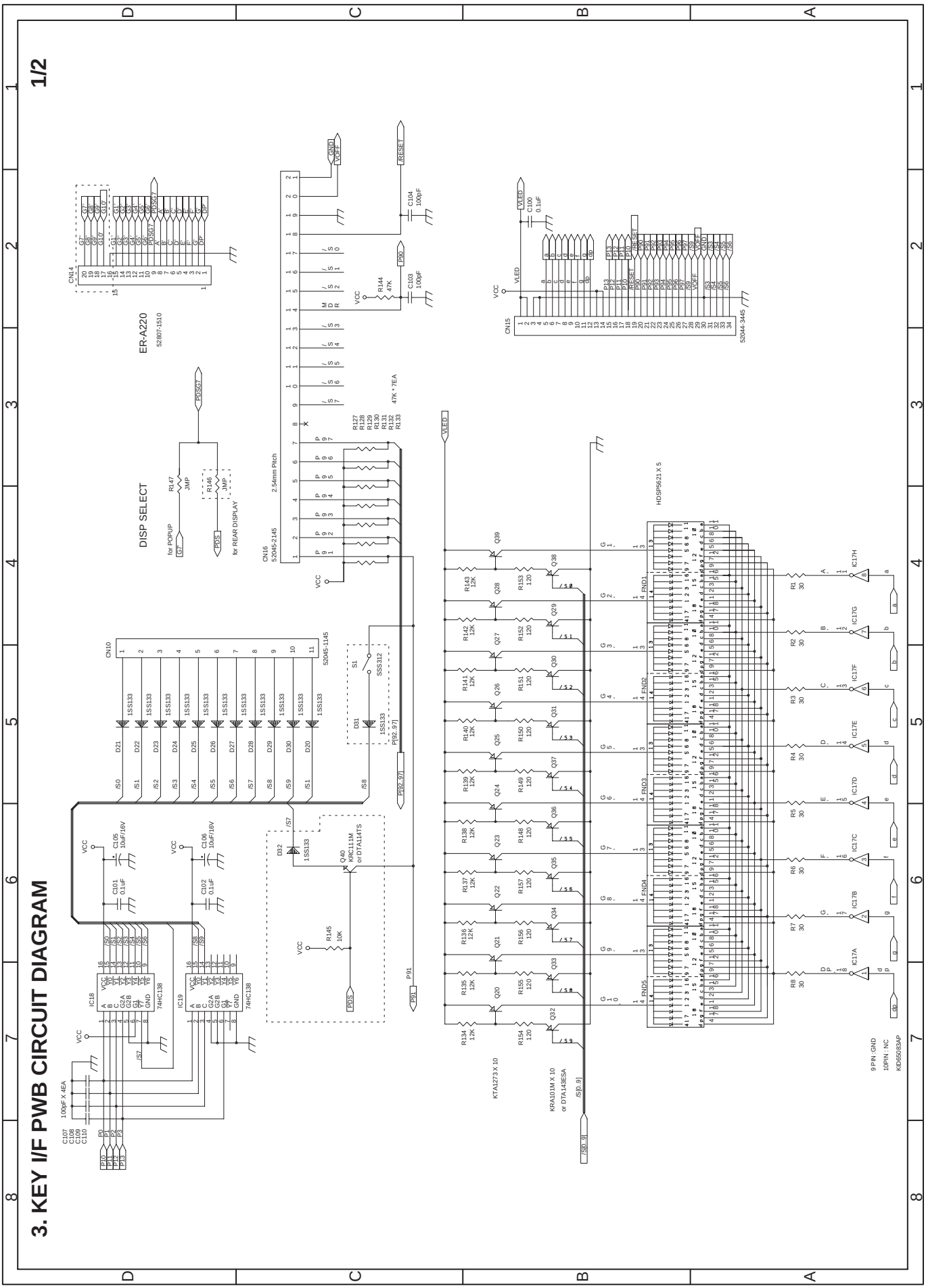

4/4
RS232C
IC11
MAX211
V+
V-
VCC
C1+
C1-
C2+
C2-
T1IN
T2IN
T3IN
T4IN
R1OUT
R2OUT
R3OUT
R4OUT
R5OUT
/EN
T1OUT
T2OUT
T3OUT
T4OUT
R1IN
R2IN
R3IN
R4IN
R5IN
/SHDN
C16 0.1uF
C17 0.1uF
C18 10uF/50V
C19 0.1uF
C32 0.1uF
C33 0.1uF
C136
C142
C143
C144
C145
1000pF * 5EA
EFCB3225137S X 8
FB101
FB102
FB103
FB104
FB105
FB106
FB107
FB108
R59
R60
R61
R62
R63
100 * 5EA
ICP1
0.5A
SP2
SHORTPIN
CN8
87203-6066
/IRS
/IER
/ISD
RD
/ICD
/ICI
/IDR
/ICS
P64
P74
P67
P66
P75
P77
P76
/S9
P91
D6
1SS353
Q4
KRC111S
VCC

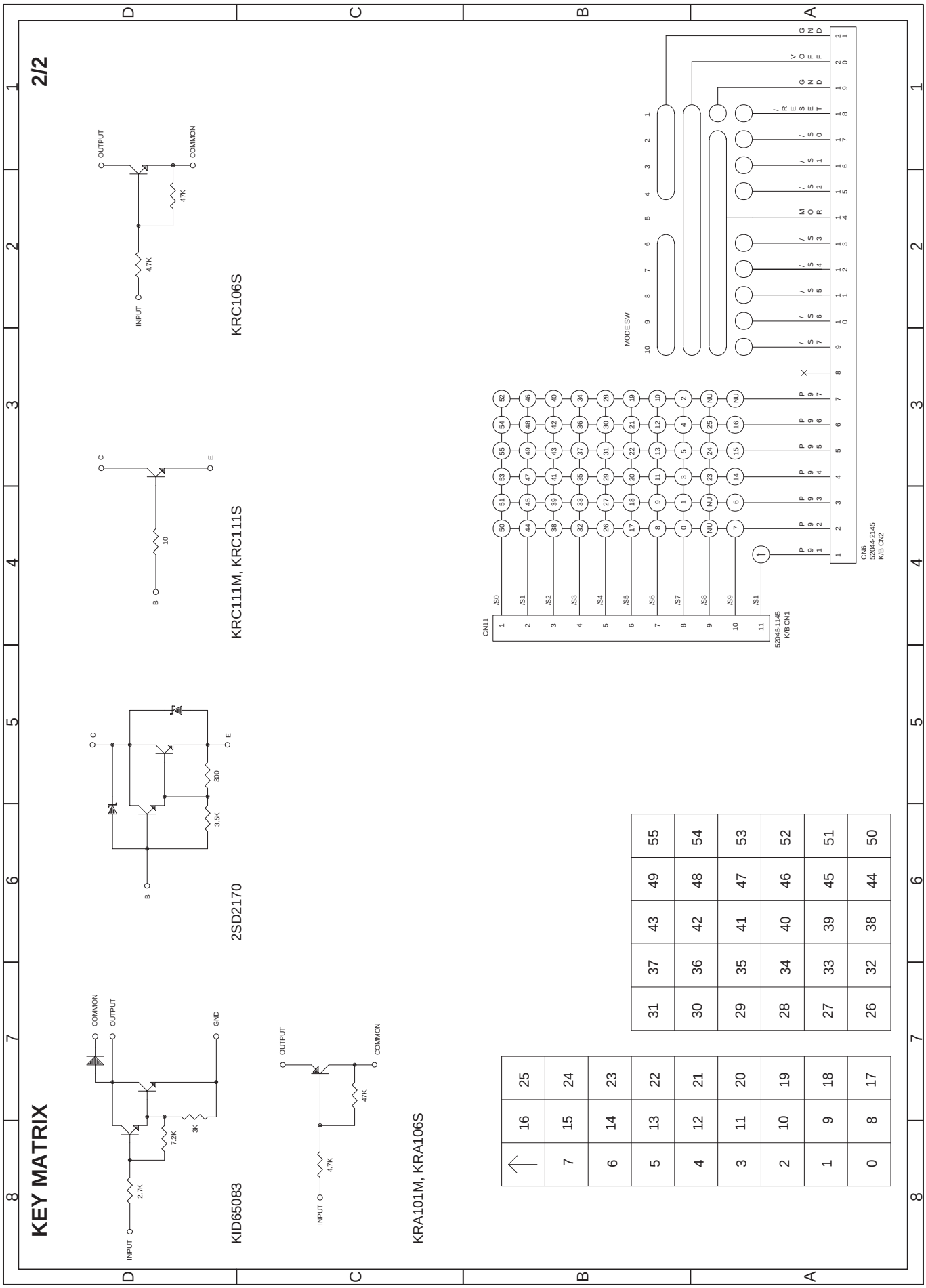
2. PRINTER I/F PWB CIRCUIT DIAGRAM



3. KEY I/F PWB CIRCUIT DIAGRAM

1/2

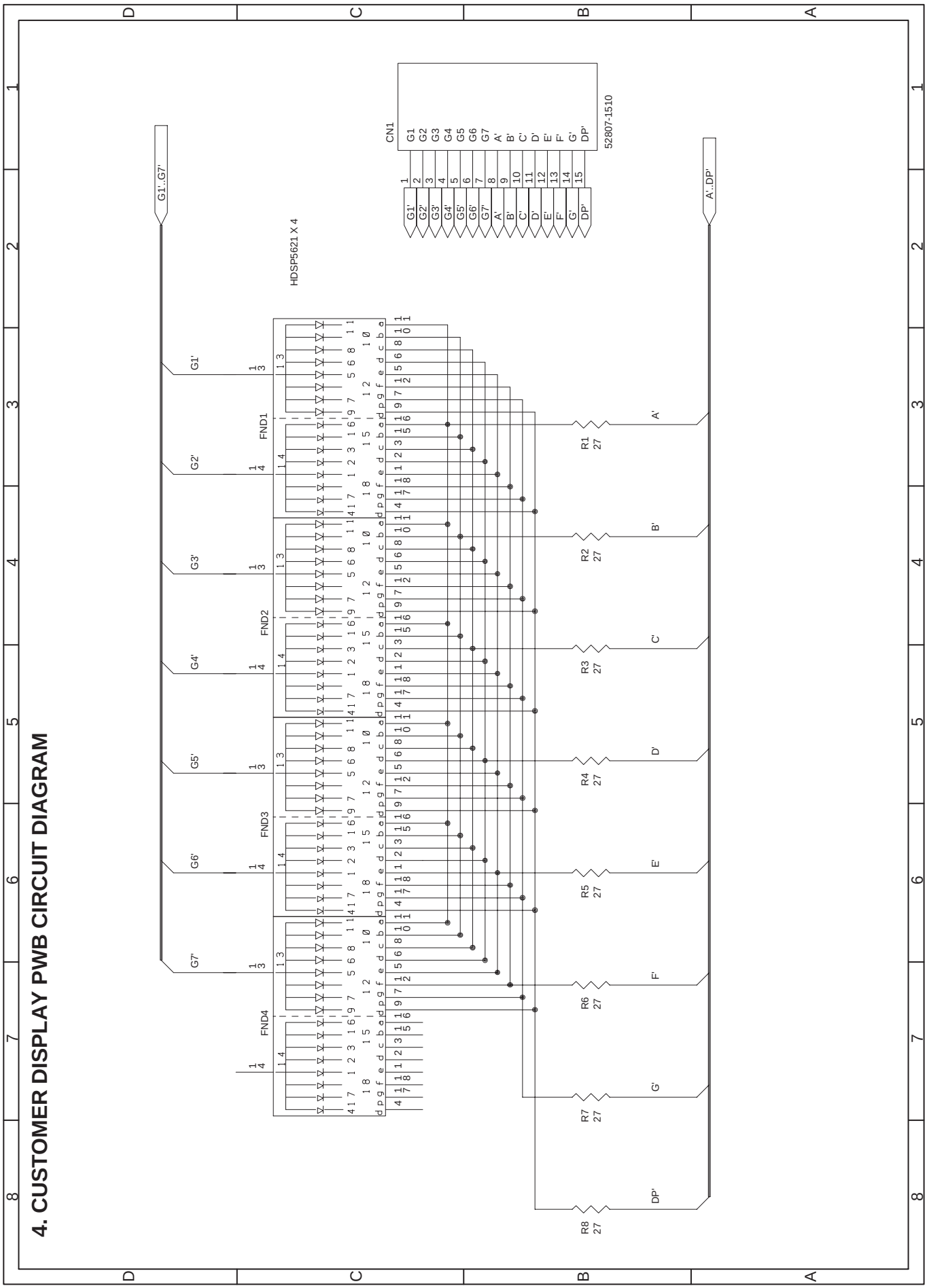




↑	16	25	24	23	22	21	20	19	18	17
7	15	14	13	12	11	10	9	8		
6	14	13	12	11	10	9	8	7		
5	13	12	11	10	9	8	7	6		
4	12	11	10	9	8	7	6	5		
3	11	10	9	8	7	6	5	4		
2	10	9	8	7	6	5	4	3		
1	9	8	7	6	5	4	3	2		
0	8	7	6	5	4	3	2	1		

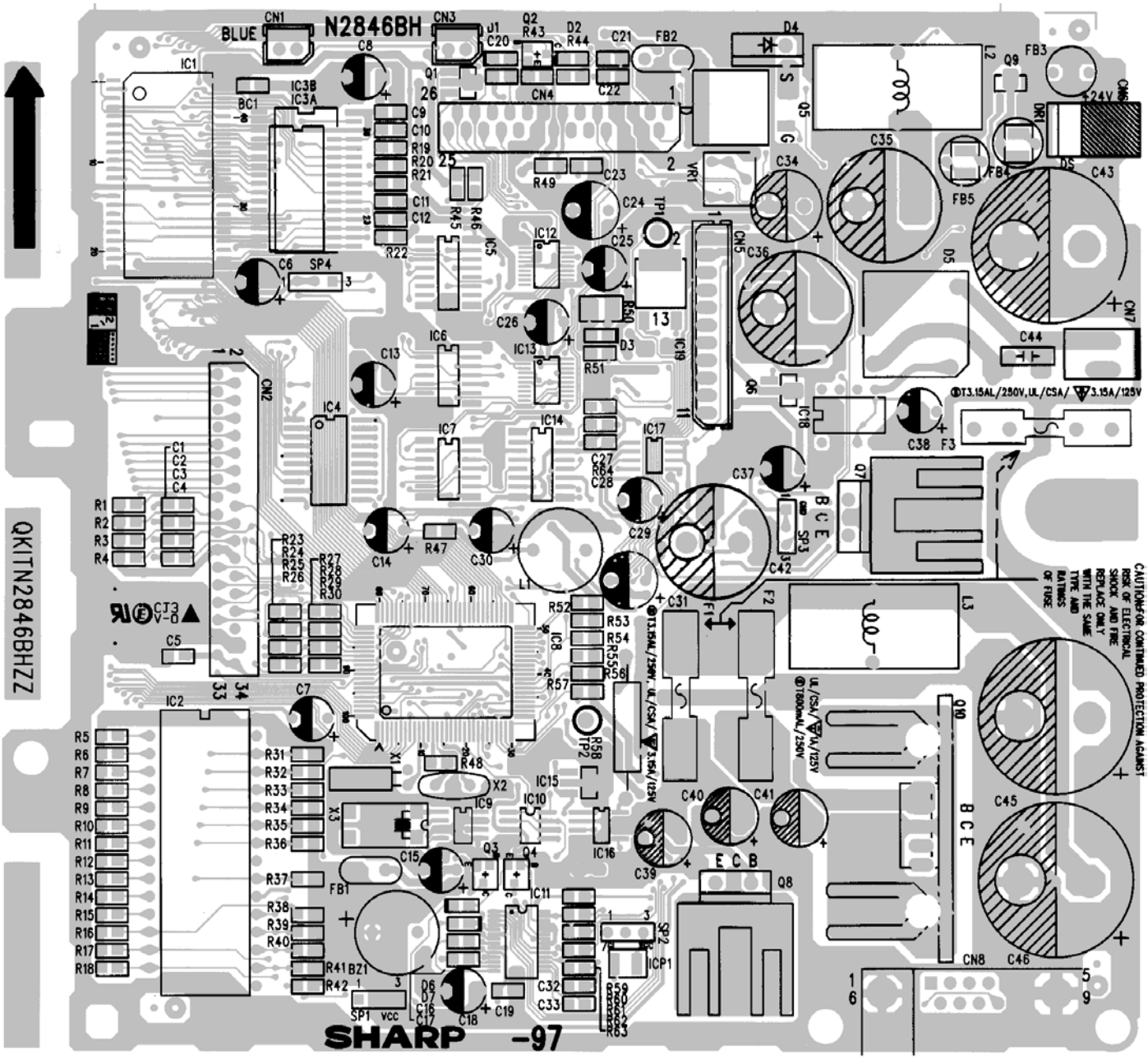
31	37	43	49	55					
30	36	42	48	54					
29	35	41	47	53					
28	34	40	46	52					
27	33	39	45	51					
26	32	38	44	50					

4. CUSTOMER DISPLAY PWB CIRCUIT DIAGRAM

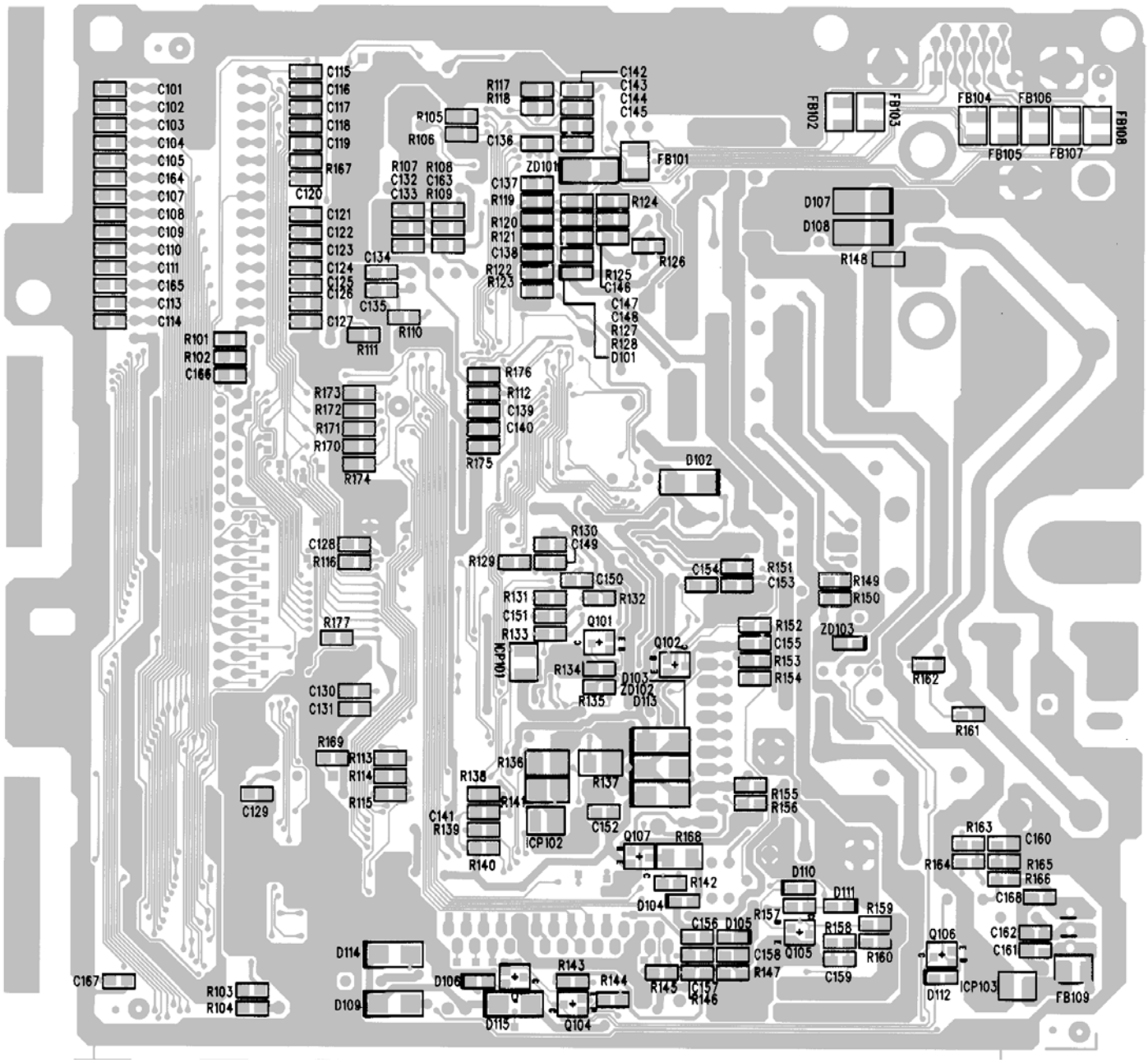


5. MAIN PWB LAYOUT

(1) Side-A


N2846BH
QKITN2846BHZZ
SHARP -97
BLUE
+24V
CAUTION:FOR CONTINUED PROTECTION AGAINST RISK OF ELECTRICAL SHOCK AND FIRE REPLACE ONLY WITH THE SAME TYPE AND RATINGS OF FUSE

(2) Side-B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Q104
D114
D109
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C168
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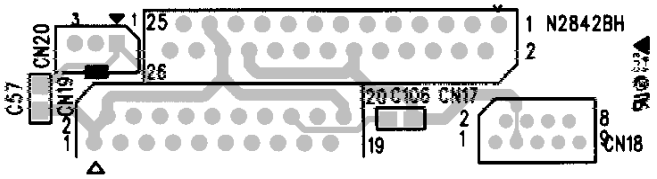
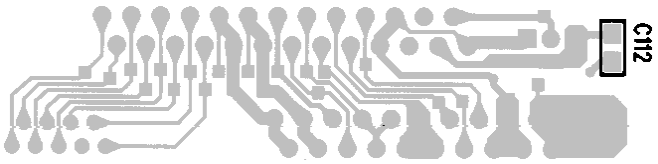
Q106
D112
ICP103
FB109

6. PRINTER I/F PWB LAYOUT

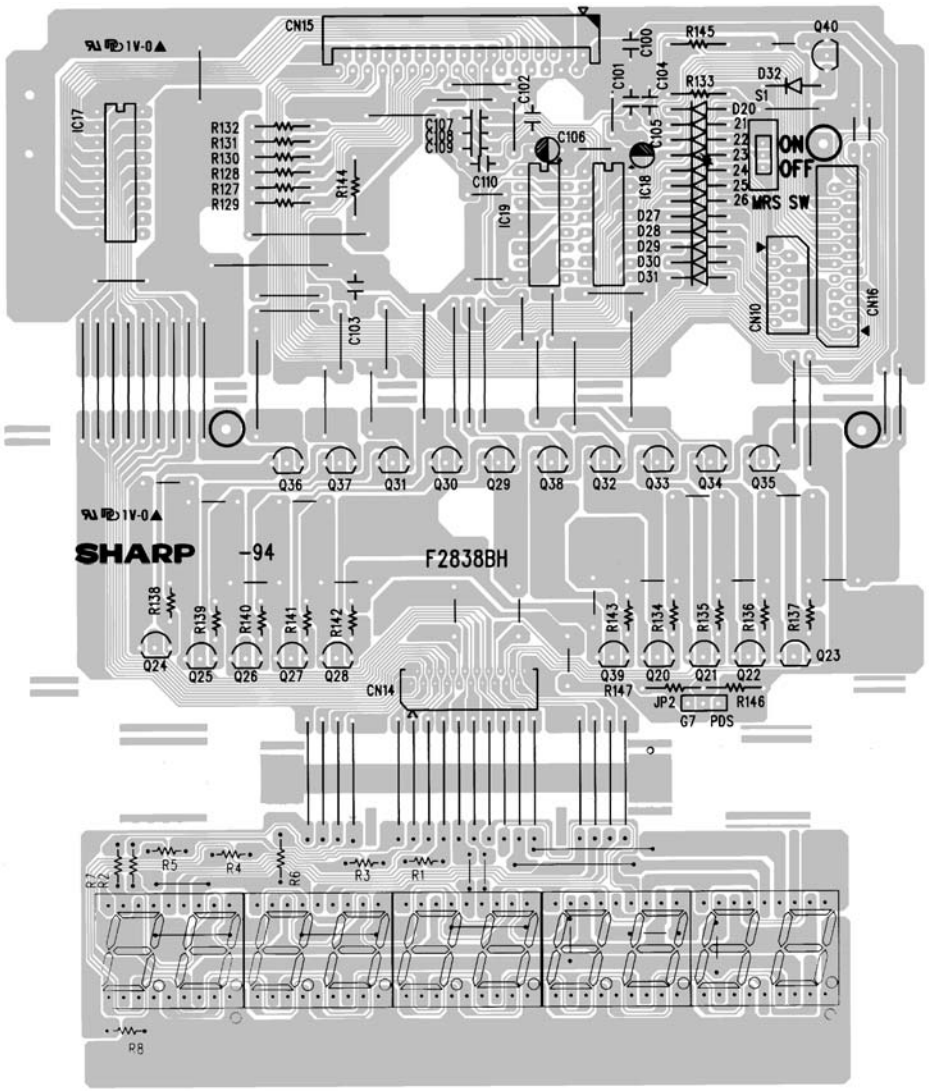
(1) Side-A



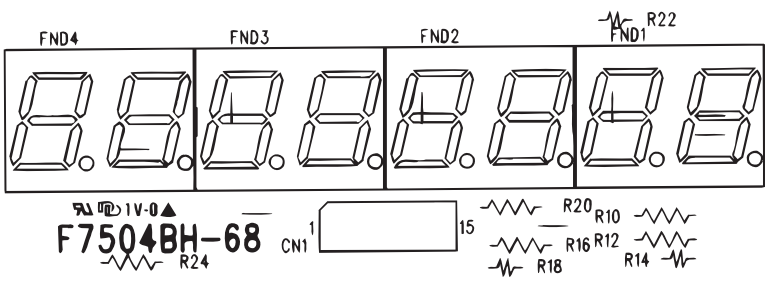
(2) Side-B



7. KEY I/F PWB



8. CUSTOMER DISPLAY PWB LAYOUT



SHARP PARTS GUIDE

MODEL ER-A220

PRINTER : LTP1245
SRV key : LKGIM7113BHZZ
(for TQ,TS,KA,KB)

CONTENTS

1 Exteriors
2 Keyboard unit
3 Packing material & Accessories
4 Drawer box unit(SK360 type)
5 Main PWB unit
6 Key i/f PWB unit
7 Pop up PWB unit
8 Printer PWB unit
9 Articles for consumption
10 Service options & Service tools
■ Index

Because parts marked with "⚠" is indispensable for the machine safety maintenance and poeration, it must be replaced with the parts specific to the product specification.

Table of destinations

SELECTION CODE	COUNTRIES
U	U.S.A., Guam
A	Canada
TS	Germany
TQ	SEEG territory other than Germany (Stamp:English)
TR	SEEG territory other than Germany (Stamp:English)
KB	U.Kingdom
KA	Australia

SELECTION CODE	COUNTRIES
K	Korea

SELECTION CODE	COUNTRIES
SB	Saudi Arabia (127V area)
SBA	Saudi Arabia (220V area)
SC	Taiwan
SD	Venezuela
SE	Hong Kong
SG	Lebanon, Syria, Greece, Pakistan, Iran, Egypt, Thailand, Iraq, Mauritius, Seychelles, Tahiti, Jordan, Sudan, Turkey
SH	South Africa (U.S.A. version)
SHE	South Africa (Europe version)
SJ	Philippines (Europe version)
SJ2	Philippines (U.S.A. version)
SM	Kuwait, Qatar, Oman, UAE, Malta, Bahrain
SMT	Nigeria, Yemen, Kenya

SELECTION CODE	COUNTRIES
RA1	Morocco, Algeria, Tunisia, West Africa
RA2	Chile, Uruguay, Peru, Argentina, Paraguay
RA5	Sri Lanka

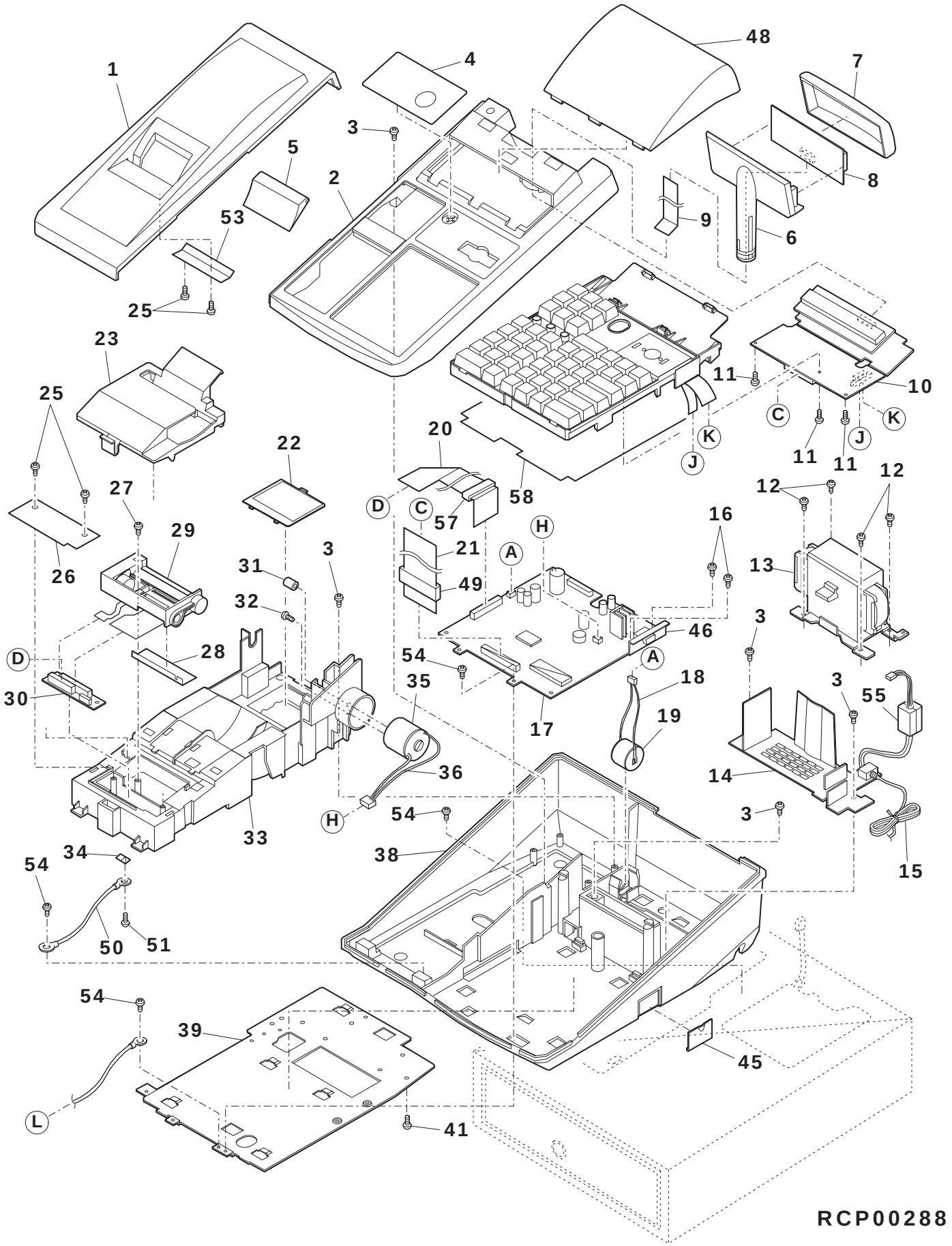
SELECTION CODE	COUNTRIES
RB3	Indonesia
RB4	
RB5	Cyprus
RB6	Panama
RB7	Barbados
RB8	Malaysia (U.S.A. version)

SELECTION CODE	COUNTRIES
RC1	Malaysia (Europe version)
RC2	Singapore
RC5	Dominican Republic, Ecuador

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	GCŌVB2488BHZZ	AU	N	D	Printer cover
2	GCABB2532BHZZ	AX		D	Top cabinet
3	XEBSD30P10000	AA		C	Screw (3×10)
4	HDECP2366BHSA	AN	N	D	Deco panel
5	PGiDH2399BHZZ	AH	N	C	Paper guide
6	GCABB2535BHZZ	AN	N	D	Pop up cabinet
7	PFiLW2431BHZZ	AP	N	D	Pop up filter
8	CPWBF7504BH01	BC		E	Pop up LED PWB unit(NORMAL)
9	QCNW−3063BHZZ	AL	N	C	Pop up flat cable (15P)
10	CPWBF2838BH04	BN	N	E	Key i/f PWB unit
11	XEBSD30P08000	AA		C	Screw (3×8)
12	XHBSD40P06000	AA		C	Screw (4×6) [for Trans]
⚠ 13	RTRNP2409BHZZ	BK	N	B	Power transformer (220V) [TQ,TS]
⚠ 13	RTRNP2410BHZZ	BK	N	B	Power transformer (240V) [KA,KB]
14	GCŌVH2489BHZZ	AT	N	D	Trans holder
⚠ 15	DUNT−3983BHZZ	AX	N	B	AC cord unit [TQ,TS]
⚠ 15	DUNT−3984BHZZ	AX	N	B	AC cord unit [KA]
⚠ 15	DUNT−3985BHZZ	BE	N	B	AC cord unit [KB]
16	XHBSD30P10000	AA		C	Screw (3×10) [for RS232C angle]
17	CPWBN2846BH01	CC	N	E	Main PWB unit
18	QCNW−3044BHZZ	AE		C	Battery cable (NI-MH)
19	UBATZ6661BHZZ	BA		B	Battery
20	QCNW−3041BHZZ	AP		C	Flat cable (26P)
21	QCNW−3042BHZZ	AQ		C	Flat cable (34P)
22	GFTAB6775BHSD	AE		D	Pattery cover
23	GDAi−2344BHZA	AM	N	D	Paper dai
25	LX−BZ6788BHZZ	AD		C	Screw [for PR sheet,Paper cutter]
26	PSHEP2885BHZZ	AK		C	PR PWB sheet
27	XJSSD26P08000	AA		C	Screw (2.6×8)
28	PSHEP2901BHZZ	AK	N	C	PR sheet L
29	Ki−ŌB2365RCZZ	BM		E	Printer unit (LTP1245)
30	CPWBN2842BH01	BH	N	E	PR i/f PWB unit
31	PGUMM6702BHZA	AC		C	Motor gum
32	XBPSD26P06000	AA		C	Screw (2.6×6) [for Motor]
33	LHLDZ2376BHZA	AS	N	C	Printer holder
34	LANGQ2851BHZZ	AF		C	Earth plate
35	RMŌTM6633BHZZ	AY		B	DC motor
36	QCNW−3043BHZZ	AE		C	Motor cable
38	GCABA2531BHZA	BD	N	D	Bottom cabinet
39	LCHSM2375BHZA	AW	N	C	Main chassis
41	XUBSD40P10000	AA		C	Screw (4×10)
45	GCŌVH2484BHZZ	AF		D	RS232C cover
46	LANGT2849BHZZ	AF		C	RS232C angle
48	PFiLW2432BHZZ	AV	N	D	Front filter
49	RCŌRF2031SCZZ	AN		C	Core (SSC-50-12-F)
50	QCNW−7904BHZZ	AE		C	Eaerth wire
51	XEBSD30P06000	AA		C	Screw (M3×6)
53	PCUT−2326BHZZ	AF		C	Paper cutter
54	XHBSD30P06000	AA		C	Screw (3×6) [for Earth GND]
55	RCŌRF6699BHZZ	AU		C	Core (BNF28)
57	RCŌRF5010BCZZ	AD		C	Ferrite core
58	PSHEP2892BHZZ	AP	N	C	Waterproof sheet

1 Exteriors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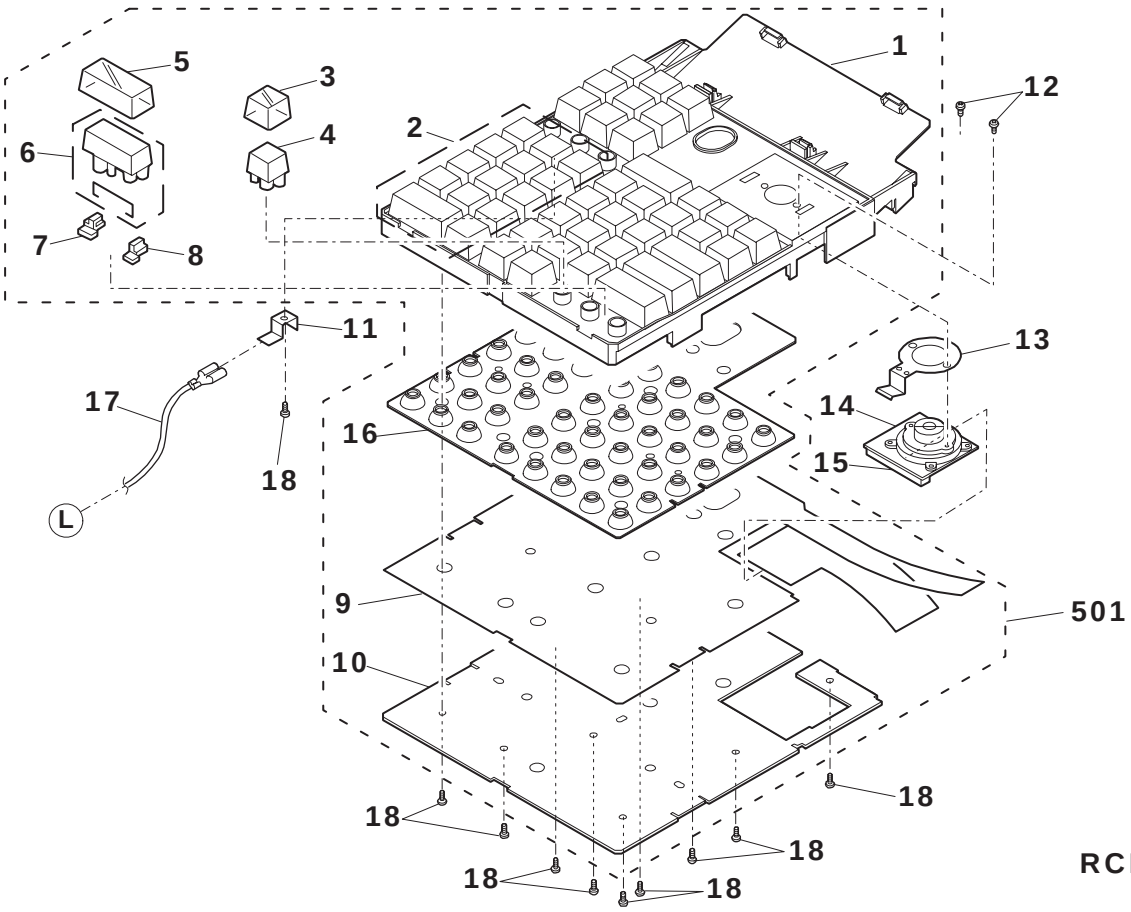
2 Keyboard unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LFRM-2360BHZZ	BC		D	Key frame
2	JKNBZ6905BHZZ	AF		C	Key top (0)
	JKNBZ6908BHZZ	AK		C	Key top (.)
	JKNBZ6909BHZZ	AK		C	Key top (X)
	JKNBZ6911BHZZ	AK		C	Key top (1)
	JKNBZ6912BHZZ	AK		C	Key top (2)
	JKNBZ6913BHZZ	AK		C	Key top (3)
	JKNBZ6914BHZZ	AK		C	Key top (4)
	JKNBZ6915BHZZ	AK		C	Key top (5)
	JKNBZ6916BHZZ	AK		C	Key top (6)
	JKNBZ6917BHZZ	AK		C	Key top (7)
	JKNBZ6918BHZZ	AK		C	Key top (8)
	JKNBZ6919BHZZ	AK		C	Key top (9)
	JKNBZ6920BHZZ	AK		C	Key top (00)
	JKNBZ6907BHZZ	AK		C	Key top (CL)
3	JKNBZ6897BHZZ	AG		C	Key cap (1×1)
4	JKNBZ6896BHZA	AG		C	Key top (1×1)
5	JKNBZ6899BHZZ	AH		C	Key cap (1×2)
6	JKNBZ6898BHZZ	AH		C	Key top (1×2)
7	LHLDZ6837BHZZ	AE		C	Holder L (YELLOW)
8	LHLDZ6836BHZZ	AE		C	Holder R (WHITE)
9	PSHEP2875BHZZ	BD		C	Sheet ass'y
10	LPLTM2355BHZZ	AX		C	Key plate
11	QTANZ2339BHZZ	AE	N	C	Faston terminal
12	XJPSD30P06000	AA		C	Screw (3×6)
13	LANGQ7604BHZZ	AG		C	Mode sw angle
14	LKGiW0001BHZZ	AS		B	Mode switch(Body)
15	QCNCM7136BHZZ	AB		C	Connector (Key)(5229-13APB)
16	PGUMM2407BHZZ	BA		C	Key rubber
17	QCNW-3049BHZZ	AE		C	GND wire
18	XEBSD30P08000	AA		C	Screw (3×8)
101	CLABH2496BH01	AX	N	D	Key label
501	DUNTK3933BH01	BN	N	E	Keyboard unit [include No.1~10,16,101]

3 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	SPAKC3077BHSA	AZ	N	D	Packing case
2	SPAKA3096BHZL	AX	N	D	Packing add L
3	PSHEP6681BHZZ	AF		D	Packing sheet
4	SPAKA3096BHZR	AX	N	D	Packing add R
5	SSAKH0013HCZZ	AA		D	Vinyl sack
6	TiNSM2402BHZZ	BD	N	D	Iinstruction book (E,F,G,S)
7	LKGiM7331BHZZ	AE		B	Lock key (1pc)
8	SSAKH1131QCZZ	AA		D	Vinyl bag (100×180mm)
9	LKGiM7110BHZZ	AE		B	MA key (MA)
	LKGiM7111BHZZ	AE		B	OP key (OP)
10	RCŌRF6699BHZZ	AU		C	Core (BNF28)
11	PGiDH2398BHZZ	AF		C	P/G wheel
12	UREL-6631BHZZ	AH		C	Spool
13	TCADH6788BHZA	AC		D	Caution card (Black)
14	UBNDA6629BHZZ	AA		C	AC cord band (4mm×200mm)(Green)
15	SSAKH4231CCZZ	AA		D	Vinyl bag (140×500mm)(SSAKH4231BHZZ)
16	TGANE1001BHZC	AG		D	Warranty card [KA]
17	TCADZ2001BHZA	AM		D	Install card [KA]
18	TiNSN7240BHZZ	AF		D	Instruction book(Battery adjust) [TQ,TS]
19	LANGK7613BHZZ	AN		C	Fixing angle B
20	TLABR2258BHZZ	AG	N	D	Bar code label

2 Keyboard unit



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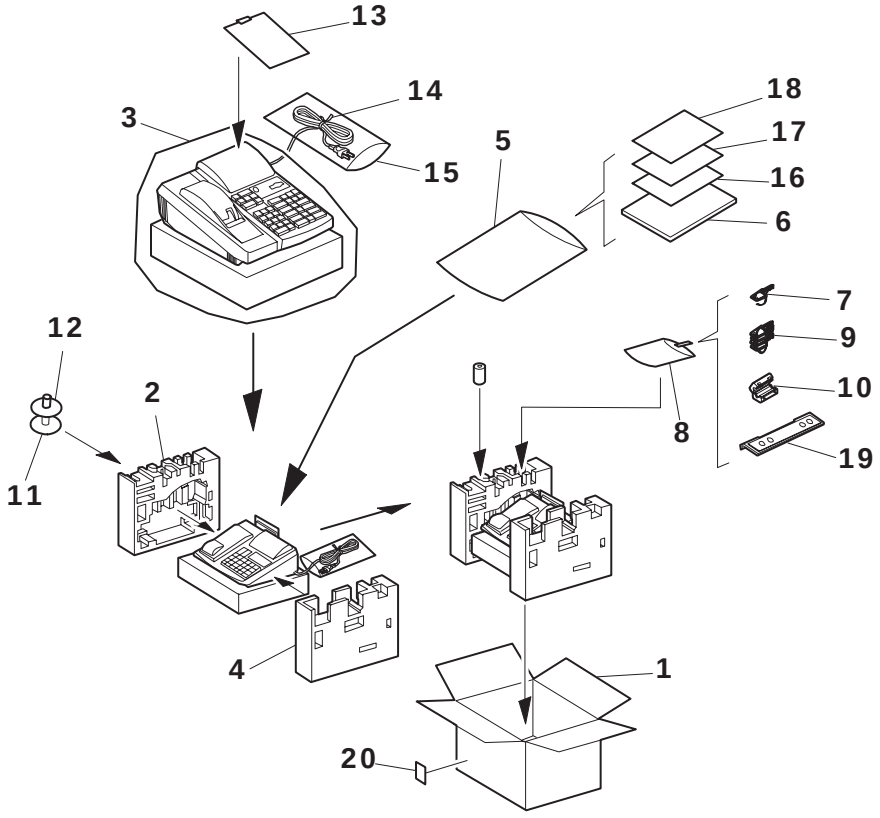
3 Packing material & Accessories



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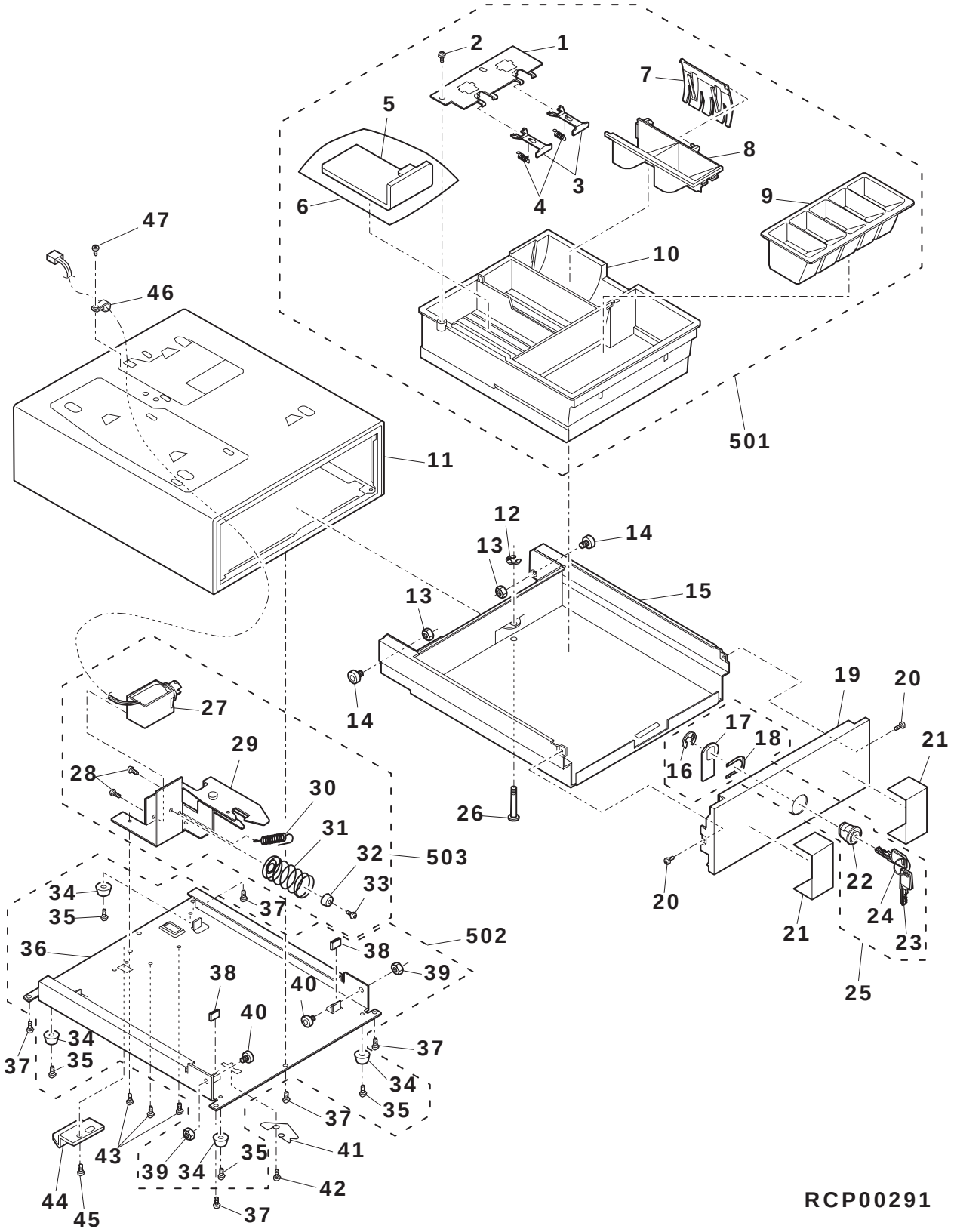
4 Drawer box unit(SK360 type)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LPLTM2354BHZZ	AS	N	C	Bracket
2	XUBSD30P08000	AA		C	Screw (3×8)
3	MLEVF6699BHZB	AF		C	Bill lever
4	MSPRT6731BHZZ	AD		C	Bill spring
5	PSKR−6629BHZZ	AL		C	Bill separator
6	SSAKA5004CCZZ	AA		D	Vinyl bag (100×300mm)
7	LPLTP2358BHZZ	AK	N	C	Bill plate
8	GCASP2328BHZZ	AR	N	D	Sub case V
9	GCASP2327BHZZ	AW	N	D	Coin case
10	GCASP2326BHZZ	BB	N	D	Money case
11	CCABM2534BH01	BF	N	D	Cabinet unit
12	XRESJ40−06000	AA		C	E type ring (4mm)
13	XNESD60−50000	AA		C	Nut (M6)
14	NRÖLP6657BHZZ	AN		C	Roller
15	CDRW−2317BH02	BF	N	D	Case frame unit
16	XRESJ50−06000	AA		C	E type ring (5mm)
17	MCAMM6633BHZA	AE		C	Lock cam
18	MSPRK6718BHZZ	AF		C	Lock key spring
19	HPNLC2478BHZZ	AS	N	D	Front cover
20	XHSSD30P06000	AA		C	Screw (M3×6)
21	SPAKA8256BHZZ	AC		D	Paper pad
22	LKGiW7330BHZZ	AY		B	Lock key (body)
23	LKGiM7331BHZZ	AE		B	Lock key (1pc)
24	PRNGT6637BHZZ	AA		C	Key ring
25	DUNT−1306BHZA	AX		E	Lock key unit
26	LPiN−2323BHZZ	AE	N	C	Lock pin
27	CPLU−2319BH01	AZ	N	B	Solenoid + Drawer cable
28	LX−BZ6775BHZZ	AA		C	Screw (3×5)
29	CFRM−2359BH02	AS	N	D	Lock frame unit
30	MSPRT2377BHZZ	AD	N	C	Open lever spring
31	MSPRC2376BHZZ	AS	N	C	Push out spring
32	PGUMM6696BHZZ	AE		C	Gum leg
33	XHBSD30P12000	AA		C	Screw (3×12)
34	PGUMM6696BHZZ	AE		C	Gum leg
35	XHBSD40P12000	AA		C	Screw (4×12)
36	LPLTM2353BHZZ	BC	N	D	Bottom plate
37	LX−BZ6782BHZZ	AA		C	Screw (3×6)
38	PGUMM6695BHZZ	AE		C	Stopper gum
39	NRÖLP6657BHZZ	AN		C	Roller
40	XNESD60−50000	AA		C	Nut (M6)
41	MSPRB2374BHZZ	AF	N	C	Earth spring
42	XHPSC30P08000	AA		C	Screw (3×8)
43	XBPSD40P06K00	AA		C	Screw (4×6K)
44	LANGK2852BHZZ	AF	N	C	Fixing angle A
45	XHPSD30P08000	AA		C	Screw (3×8)
46	LHLDW0024BHZZ	AG		C	Holder (3N)
47	LX−BZ6778BHZZ	AA		C	Screw
501	CCASP2326BH01	BH	N	E	Money case unit (3B/7C)
502	CPLTM2353BH01	BF	N	E	Bottom plate unit
503	DUNTM2359BH02	BC	N	E	Lock unit
504	CDRW−2317BH01	BL	N	E	Drawer case unit [include No.12~15,19,20,26]
	(Unit)				
901	GBÖXD2326BHZZ	BY	N	E	Drawer box unit

4 Drawer box unit(SK360 type)



5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	LX−BZ6644BHZZ	AA		C	Screw (M3.5×8S)	[Q10]
2	PRDAF2374BHZZ	AM	N	C	Heat sink	(for KTD998)[Q10]
3	PRDAF6656BHZZ	AK		C	Heat sink	[Q7,8]
4	QCNCM1060AC03	AB		C	Connector (Short Pin 3P)	[SP1,2]
5	QCNCM1101CCZZ	AB		C	Connector (2pin)(QCNCM1101BHZZ)	[CN7]
6	QCNCM5278NCZZ	AC		C	Connector (3pin)(5046-03A)	[CN6]
7	QCNCM6865RC0B	AA		C	Connector (2pin)(5267-02A)(QCNCM6865BH0B)	[CN3]
8	QCNCM7125BH0i	AN		C	Connector ((9P) MLX 87023-6066))	[CN8]
9	QCNCW1057ACZZ	AB		C	Connector (Short socket)	[SP1,2]
10	QCNCW2822BH2F	AH		C	Connector (52045-2645)	[CN4]
11	QCNCW2822BH3D	AK		C	Connector (K/B)(52045-3445)	[CN2]
12	QCNCW7081BHZZ	AB		C	Connector (2P)(5267-02A)(Blue)	[CN1]
⚠ 13	QFS−C4301CCZZ	AE		A	Fuse (T800mA/250V)	[F2]
⚠ 14	QFS−C1025CCZZ	AF		A	Fuse (3.15A/250V)	[F1,3]
15	QFSHD2109AFZZ	AC		C	Fuse holder	[F1,2,3]
16	QSŌCZ2042SC32	AE		C	IC socket (32pin)	[IC2]
17	RALMB6646BHZZ	AQ		B	Buzzer	[BZ1]
18	RC−EZ106ARC1A	AD		C	Capacitor (10WV 10μF)	[C15]
19	RC−EZ3381QCZZ	AR	N	C	Capacitor (3300μF/50V)	[C43,45]
20	RCiLC2417BHZZ	AK	N	C	Coil (220μH/2A)	[L1]
21	RCiLC6653BHZZ	AS		C	Choke coil (180μH)	[L2,3]
22	RCiLZ1003BHZZ	AF		C	Dip coil (BFW7550R2)	[FB1,2]
23	RCŌRF7002BHZZ	AE		C	Chip core (EFCB322513TS)	[FB101,102,103,104,105,106,107]
	RCŌRF7002BHZZ	AE		C	Chip core (EFCB322513TS)	[FB108]
24	RCRSP6676RCZZ	AG		B	Crystal (32.768KHz)	[X1]
25	RCRSZ2401RCZZ	AL	N	B	X-TAL (MA-406/12MHz)	[X3]
26	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C1,2,3,4]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C101,102,103,115,116,117,118,119]
	VCCCTV1HH101J	AA		C	Capacitor (50WV 100PF)	[C139,141]
27	VCCCTV1HH151J	AA		C	Capacitor (50WV 150pF)	[C104,105,107,108,109,110,111,113]
	VCCCTV1HH151J	AA		C	Capacitor (50WV 150pF)	[C114,120,121,122,123,124,125,126]
	VCCCTV1HH151J	AA		C	Capacitor (50WV 150pF)	[C12]
	VCCCTV1HH151J	AA		C	Capacitor (50WV 150pF)	[C164,165]
28	VCCCTV1HH180J	AA		C	Capacitor (50WV 18PF)	[C134]
29	VCCCTV1HH221J	AA		C	Capacitor (50WV 220PF)	[C146]
30	VCCCTV1HH270J	AC		C	Capacitor (50WV 27pF)	[C135]
31	VCCCTV1HH300J	AA		C	Capacitor (50WV 30PF)	[C128]
32	VCCCTV1HH6R0C	AB		C	Capacitor (50WV 6.0PF)	[C132,133]
33	VCCSTV1HL181J	AD		C	Capacitor (50WV 180pF)	[C153]
34	VCEA2U1HW228M	AH		C	Capacitor (50WV 2200μF)	[C46]
35	VCEAGA1CW337M	AB		C	Capacitor (16WV 330μF)	[C24,31]
36	VCEAGA1HW104M	AB		C	Capacitor (50WV 0.1μF)	[C29]
37	VCEAGA1HW106M	AA		C	Capacitor (50WV 10μF)	[C7,8,13,14,18,25,26,30]
38	VCEAGA1HW107M	AA		C	Capacitor (50WV 100μF)	[C39,40,41]
39	VCEAGA1HW225M	AA		C	Capacitor (50WV 2.2μF)	[C38]
40	VCEAGD1CW108M	AE		C	Capacitor (16WV 1000μF)	[C34]
41	VCEAGD1CW478M	AP		C	Capacitor (4700μF/16V)	[C35,36,42]
42	VCKYTV1HB102K	AA		C	Capacitor (50WV 1000PF)	[C136,142,143,144,145,148]
43	VCKYTV1HB103K	AB		C	Capacitor (50WV 0.01μF)(NC60)	[C149,150,151]
	VCKYTV1HB103K	AB		C	Capacitor (50WV 0.01μF)(NC60)	[C27]
44	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C127,131,140,147,152,156,157]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C158,159,161,162,163]
	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C5,9,16,17,19,20,22,23,28,32,33]
45	VCQYNA1HM333K	AA		C	Capacitor (50WV 0.033μF)	[C44]
46	VHD1SR154001	AB		B	Diode (1SR1544001)	[D103,113,115]
47	VHD1SR159//−1	AF	N	B	Diode (1SR159-200)	[D108,109]
48	VHD1SS353//−1	AB		B	Diode (1SS353)	[D1,3,6,7]
	VHD1SS353//−1	AB		B	Diode (1SS353)	[D104,105,106,110,111]
49	VHDCP301///−1	AL		B	Diode (CP301)	[D5]
50	VHDFMB−G24H/1	AH		B	Diode (FMG-G24H)	[D4]
51	VHDRB060L//−1	AK		B	Diode (RB060L40)	[D102]
52	VHEPTZ6.2A/−1	AH		B	Zener diode (PTZ6.2A)	[ZD102]
53	VHEPTZ9.1B+−1	AG	N	B	Zener diode (PTZ9.1B)	[ZD101]
54	VHEUDZ5.1B/−1	AC		B	Zener diode (UDZ5.1B)	[ZD103]
55	VHi30624FG001	BD	N	B	CPU (M30624FGFP)	[IC8]
56	VHi74F139SJ−1	AG	N	B	IC (74F139)	[IC5]
57	VHiBA10393F−1	AC		B	IC (BA10393F)	[IC10]
58	VHiHM128F12SL	BN		B	IC (HM128F12SL)	[IC3B]
59	VHiKiA431F/−1	AK		B	IC (KIA431F)	[IC15]
60	VHiLB1843V/−1	AM		B	IC (LB1843V)	[IC12,13]
61	VHiLM2574−ADJ	AU		B	IC (LM2574HVN-ADJ)	[IC18]
62	VHiMAX211CAi1	AW		B	IC (MAX211)(VHIMAX211CAI-)	[IC11]
63	VHiMC34063AM1	AG		B	IC (MC34063AM1)	[IC16,17]
64	VHiMC74HC123F	AM		B	IC (74HC123)(VHISN74HC123D)	[IC14]
65	VHiSN74HC32DR	AG		B	IC (SN74HC32D)	[IC7]
66	VHiSN74HC374D	AL		B	IC (SN74HC374D)	[IC4]
67	VHiW42C3103G/	AU		B	IC (W42C3103G)	[IC9]
68	VHViCPS0.5/−1	AF		B	IC-protector (ICPS0.5)	[ICP1]
69	VHViCPS1.0/−1	AF		B	IC protector (ICPS1.0)	[ICP103]
70	VRS−FC3LG470J	AF	N	C	Resistor (3W 47Ω ±5%)	[R58]

5 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
71	VRS-TP2EG1R0J	AC	N	C	Resistor (1/4W 1Ω ±5%)	[R136,137,141]
	VRS-TP2EG1R0J	AC	N	C	Resistor (1/4W 1Ω ±5%)	[R50]
72	VRS-TS2EP151J	AA	N	C	Resistor (1/4W 150Ω ±5%)	[R168]
73	VRS-TS2AD000J	AA		C	Resistor (1/10W 0Ω ±5%)	[R101,108,167]
74	VRS-TS2AD100J	AA		C	Resistor (1/10W 10Ω ±5%)	[R148,151]
75	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R23,24,25,26,27,28,29,30,59,60]
	VRS-TS2AD101J	AA		C	Resistor (1/10W 100Ω ±5%)	[R61,62,63]
76	VRS-TS2AD102F	AA		C	Resistor (1/10W 1KΩ ±1%)	[R131,132,156]
77	VRS-TS2AD102J	AA		C	Resistor (1/10W 1.0KΩ ±5%)	[R163]
78	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R1,2,3,4,5,6,7,8,9,10]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R11,12,13,14,15,16,17,18,19,20]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R112,115,116,130,133,138,158,159]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R160,175]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R21,22,31,32,33,34,35,36,37,38]
	VRS-TS2AD103J	AA		C	Resistor (1/10W 10KΩ ±5%)	[R39,40,41,42,47,53,56]
79	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R143]
	VRS-TS2AD104J	AA		C	Resistor (1/10W 100KΩ ±5%)	[R43]
80	VRS-TS2AD122F	AA		C	Resistor (1/10W 1.2KΩ ±1%)	[R150]
81	VRS-TS2AD133F	AA		C	Resistor (1/10W 13KΩ ±1%)	[R122]
82	VRS-TS2AD153J	AA		C	Resistor (1/10W 15Ω ±5%)	[R164]
	VRS-TS2AD153J	AA		C	Resistor (1/10W 15Ω ±5%)	[R46]
83	VRS-TS2AD182J	AA		C	Resistor (1/10W 1.8KΩ ±5%)	[R51]
84	VRS-TS2AD183J	AA		C	Resister (1/10W 18KΩ ±5%)	[R161]
	VRS-TS2AD183J	AA		C	Resister (1/10W 18KΩ ±5%)	[R49]
85	VRS-TS2AD221J	AA		C	Resistor (1/10W 220Ω ±5%)	[R139,140]
86	VRS-TS2AD222J	AA		C	Resistor (1/10W 2.2KΩ ±5%)	[R45]
87	VRS-TS2AD223F	AA		C	Resistor (1/10W 22KΩ ±1%)	[R149]
88	VRS-TS2AD241J	AA		C	Resistor (1/10W 240Ω ±5%)	[R127]
89	VRS-TS2AD242F	AB		C	Resistor (1/10W 2.4KΩ ±1%)	[R121]
90	VRS-TS2AD270J	AA		C	Resistor (1/10W 27Ω ±5%)	[R126]
91	VRS-TS2AD272F	AA		C	Resistor (1/10W 2.7KΩ ±1%)	[R123,135]
92	VRS-TS2AD272J	AA		C	Resistor (1/10W 2.7KΩ ±5%)	[R128]
93	VRS-TS2AD302F	AB		C	Resistor (1/10W 3.0KΩ ±1%)	[R120,129]
	VRS-TS2AD302F	AB		C	Resistor (1/10W 3.0KΩ ±1%)	[R64]
94	VRS-TS2AD330J	AA		C	Resistor (1/10W 33Ω ±5%)	[R109,162]
95	VRS-TS2AD331J	AA		C	Resistor (1/10W 330Ω ±5%)	[R110]
96	VRS-TS2AD332F	AA		C	Resistor (1/10W 3.3KΩ ±1%)	[R134]
97	VRS-TS2AD362F	AA		C	Resistor (1/10W 3.6KΩ ±1%)	[R155]
98	VRS-TS2AD472J	AA		C	Resistor (1/10W 4.7KΩ ±5%)	[R111,157,169]
99	VRS-TS2AD473J	AA		C	Resistor (1/10W 47KΩ ±5%)	[R105,106,117,118,170,171,172,173,174]
100	VRS-TS2AD563J	AA		C	Resistor (1/10W 56KΩ ±5%)	[R119]
101	VRS-TS2AP161J	AA	N	C	Resistor (1/10W 160Ω ±5%)	[R103,104]
102	VRS-TS2AP203F	AB	N	C	Resistor (1/10W 20KΩ ±1%)	[R124]
103	VRS-TS2AP392F	AB	N	C	Resistor (1/10W 3.9KΩ ±1%)	[R125]
104	VS2SA1471-RSC	AG		B	Transistor (2SA1471-RSC)	[Q8]
105	VS2SC4153-//-1	AG		B	Transistor (2SC4153)	[Q7]
106	VS2SD2170//-1	AH		B	Transistor (2SD2170)	[Q1,9]
107	VS2SJ328-Z//-1	AP		B	Transistor (2SJ328-Z)	[Q5]
108	VS2SK2731//-1	AD		B	Chip FET (2SK2731)	[Q103]
	VS2SK2731//-1	AD		B	Chip FET (2SK2731)	[Q2]
109	VSKRA106S//-1	AF		B	Transistor (KRA106S)	[Q107]
110	VSKRC106S//-1	AD		B	Transistor (KRC106S)	[Q105]
	VSKRC106S//-1	AD		B	Transistor (KRC106S)	[Q3]
111	VSKRC111S//-1	AD		B	Transistor (KRC111S)	[Q4]
112	VSKTD998//-1	AS		B	Transistor (2SD998)	[Q10]
113	XBPSD30P06000	AA		C	Screw (3×6)	(for D998,A1471,C4153 fixed)[Q7,8,10]
	(Unit)					
901	CPWBN2846BH01	CC	N	E	Main PWB unit	

6 Key i/f PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	QCNCW2822BH1A	AF		C	Connector (K/B)(52045-1145)	[CN10]
2	QCNCW2822BH2A	AH		C	Connector (K/B)(52045-2145)	[CN16]
3	QCNCW2823BH3D	AK		C	Connector (52044-3445)	[CN15]
4	QCNCW7202BH1E	AK		C	Connector (52807-1510)	[CN14]
5	RC-KZ1054CCZZ	AB		C	Capacitor (50WV 0.1μF)(RPE132-906)	[C100,101,102]
6	VCEAJA1CW106M	AB		C	Capacitor (16WV 10μF)	[C105,106]
7	VCKYPU1HB101K	AA		C	Capacitor (50WV 100PF)(VCKYPA1HB101K)	[C103,104,107,108,109,110]
8	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D20,21,22,23,24,25,26,27,28]
	VHDDSS133HV-1	AA		B	Diode (DSS133HV)	[D29,30]
9	VHiKiD65083AP	AM		B	IC (KID65083AP)	[IC17]
10	VHiSN74HC138N	AL		B	IC (74HC138)	[IC18,19]
11	VHPHDSP5621-1	AM		B	LED (2SEG)	[FND1,2,3,4,5]
12	VRD-RC2EY121J	AA		C	Resistor (1/4W 120Ω ±5%)	[R148,149,150,151,152,153,154,155]
	VRD-RC2EY121J	AA		C	Resistor (1/4W 120Ω ±5%)	[R156,157]

6 Key i/f PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
13	VRD-RC2EY123J	AA		C	Resistor (1/4W 12KΩ ±5%) [R134,135,136,137,138,139,140,141]
	VRD-RC2EY123J	AA		C	Resistor (1/4W 12KΩ ±5%) [R142,143]
14	VRD-RC2EY300J	AA		C	Resistor (1/4W 30Ω ±5%) [R1,2,3,4,5,6,7,8]
15	VRD-RC2EY473J	AA		C	Resistor (1/4W 47KΩ ±5%) [R127,128,129,130,131,132,133,144]
16	VSKRA101M//-1	AD		B	Transistor (KRA101M) [Q29,30,31,32,33,34,35,36,37,38]
17	VSKTA1273//-1	AF		B	Transistor (KRA1273) [Q20,21,22,23,24,25,26,27,28,39]
	(Unit)				
901	CPWBF2838BH04	BN	N	E	Key i/f PWB unit

7 Pop up PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCW7202BH1E	AK		C	Connector (52807-1510) [CN1]
2	VHPHDSP5621-1	AM		B	LED (2SEG)(HDSP5621) [FND1,2,3,4]
3	VRD-RC2EY270J	AA		C	Resistor (1/4W 27Ω ±5%) [R10,12,14,16,18,20,22,24]
	(Unit)				
901	CPWBF7504BH01	BC		E	Pop up LED PWB unit(NORMAL)

8 Printer PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	QCNCW2822BH2F	AH		C	Connector (52045-2645) [CN17]
2	QCNCW2822BH2J	AG		C	Connector (52045-2045) [CN19]
3	QCNCW7201BH0i	AH		C	Connector (52806-0910) [CN18]
4	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF) [C57,106]
5	QCNCM7176BH0C	AC		C	Connector (53014-0310) (NOT USED)[CN20]
	(Unit)				
901	CPWBN2842BH01	BH	N	E	PR i/f PWB unit

9 Articles for consumption

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	TPAPR2377RCZZ	AL	N	S	Roll paper (1roll/pack)

10 Service options & Service tools

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	LKGiM7113BHZZ	AF		S	Service key
2	LKGiM7126BHZZ	AX		S	Mode key grip cover [OP key only]
3	GCŌVH2486BHZZ	BD		S	Drip-proof keyboard cover [include the switch cover]
11	UKŌG-6705RCZZ	BC		S	RS-232 loop back connector
12	UKŌG-6634RCZZ	AX		S	Key top remover
13	UKŌG-6725BHZZ	BB		S	Key top installing jig (2×2)

■ Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
【C】					
CCABM2534BH01	4- 11	BF	N	D	
CCASP2326BH01	4-501	BH	N	E	
CDRW-2317BH01	4-504	BL	N	E	
CDRW-2317BH02	4- 15	BF	N	D	
CFRM-2359BH02	4- 29	AS	N	D	
CLABH2496BH01	2-101	AX	N	D	
CPLTM2353BH01	4-502	BF	N	E	
CPLU-2319BH01	4- 27	AZ	N	B	
CPWBF2838BH04	1- 10	BN	N	E	
〃	6-901	BN	N	E	
CPWBF7504BH01	1- 8	BC		E	
〃	7-901	BC		E	
CPWBN2842BH01	1- 30	BH	N	E	
〃	8-901	BH	N	E	
CPWBN2846BH01	1- 17	CC	N	E	
〃	5-901	CC	N	E	
【D】					
DUNT-1306BHZA	4- 25	AX		E	
DUNT-3983BHZZ	1- 15	AX	N	B	
DUNT-3984BHZZ	1- 15	AX	N	B	
DUNT-3985BHZZ	1- 15	BE	N	B	
DUNTK3933BH01	2-501	BN	N	E	
DUNTM2359BH02	4-503	BC	N	E	
【G】					
GBŌXD2326BHZZ	4-901	BY	N	E	
GCABA2531BHZA	1- 38	BD	N	D	
GCABB2532BHZZ	1- 2	AX		D	
GCABB2535BHZZ	1- 6	AN	N	D	
GCASP2326BHZZ	4- 10	BB	N	D	
GCASP2327BHZZ	4- 9	AW	N	D	
GCASP2328BHZZ	4- 8	AR	N	D	
GCŌVB2488BHZZ	1- 1	AU	N	D	
GCŌVH2484BHZZ	1- 45	AF		D	
GCŌVH2486BHZZ	10- 3	BD		S	
GCŌVH2489BHZZ	1- 14	AT	N	D	
GDAi-2344BHZA	1- 23	AM	N	D	
GFTAB6775BHSD	1- 22	AE		D	
【H】					
HDECP2366BHSA	1- 4	AN	N	D	
HPNLC2478BHZZ	4- 19	AS	N	D	
【J】					
JKNBZ6896BHZA	2- 4	AG		C	
JKNBZ6897BHZZ	2- 3	AG		C	
JKNBZ6898BHZZ	2- 6	AH		C	
JKNBZ6899BHZZ	2- 5	AH		C	
JKNBZ6905BHZZ	2- 2	AF		C	
JKNBZ6907BHZZ	2- 2	AK		C	
JKNBZ6908BHZZ	2- 2	AK		C	
JKNBZ6909BHZZ	2- 2	AK		C	
JKNBZ6911BHZZ	2- 2	AK		C	
JKNBZ6912BHZZ	2- 2	AK		C	
JKNBZ6913BHZZ	2- 2	AK		C	
JKNBZ6914BHZZ	2- 2	AK		C	
JKNBZ6915BHZZ	2- 2	AK		C	
JKNBZ6916BHZZ	2- 2	AK		C	
JKNBZ6917BHZZ	2- 2	AK		C	
JKNBZ6918BHZZ	2- 2	AK		C	
JKNBZ6919BHZZ	2- 2	AK		C	
JKNBZ6920BHZZ	2- 2	AK		C	
【K】					
Ki-ŌB2365RCZZ	1- 29	BM		E	
【L】					
LANGK2852BHZZ	4- 44	AF	N	C	
LANGK7613BHZZ	3- 19	AN		C	
LANGQ2851BHZZ	1- 34	AF		C	
LANGQ7604BHZZ	2- 13	AG		C	
LANGT2849BHZZ	1- 46	AF		C	
LCHSM2375BHZA	1- 39	AW	N	C	
LFRM-2360BHZZ	2- 1	BC		D	
LHLDW0024BHZZ	4- 46	AG		C	
LHLDZ2376BHZA	1- 33	AS	N	C	
LHLDZ6836BHZZ	2- 8	AE		C	
LHLDZ6837BHZZ	2- 7	AE		C	
LKGiM7110BHZZ	3- 9	AE		B	
LKGiM7111BHZZ	3- 9	AE		B	
LKGiM7113BHZZ	10- 1	AF		S	
LKGiM7126BHZZ	10- 2	AX		S	
LKGiM7331BHZZ	3- 7	AE		B	
LKGiM7331BHZZ	4- 23	AE		B	
LKGiW0001BHZZ	2- 14	AS		B	
LKGiW7330BHZZ	4- 22	AY		B	
LPiN-2323BHZZ	4- 26	AE	N	C	
LPLTM2353BHZZ	4- 36	BC	N	D	
LPLTM2354BHZZ	4- 1	AS	N	C	
LPLTM2355BHZZ	2- 10	AX		C	
LPLTP2358BHZZ	4- 7	AK	N	C	
LX-BZ6644BHZZ	5- 1	AA		C	
LX-BZ6775BHZZ	4- 28	AA		C	
LX-BZ6778BHZZ	4- 47	AA		C	
LX-BZ6782BHZZ	4- 37	AA		C	
LX-BZ6788BHZZ	1- 25	AD		C	
【M】					
MCAMM6633BHZA	4- 17	AE		C	
MLEVF6699BHZB	4- 3	AF		C	
MSPRB2374BHZZ	4- 41	AF	N	C	
MSPRC2376BHZZ	4- 31	AS	N	C	
MSPRK6718BHZZ	4- 18	AF		C	
MSPRT2377BHZZ	4- 30	AD	N	C	
MSPRT6731BHZZ	4- 4	AD		C	
【N】					
NRŌLP6657BHZZ	4- 14	AN		C	
〃	4- 39	AN		C	
【P】					
PCUT-2326BHZZ	1- 53	AF		C	
PFiLW2431BHZZ	1- 7	AP	N	D	
PFiLW2432BHZZ	1- 48	AV	N	D	
PGiDH2398BHZZ	3- 11	AF		C	
PGiDH2399BHZZ	1- 5	AH	N	C	
PGUMM2407BHZZ	2- 16	BA		C	
PGUMM6695BHZZ	4- 38	AE		C	
PGUMM6696BHZZ	4- 32	AE		C	
〃	4- 34	AE		C	
PGUMM6702BHZA	1- 31	AC		C	
PRDAF2374BHZZ	5- 2	AM	N	C	
PRDAF6656BHZZ	5- 3	AK		C	
PRNGT6637BHZZ	4- 24	AA		C	
PSHEP2875BHZZ	2- 9	BD		C	
PSHEP2885BHZZ	1- 26	AK		C	
PSHEP2892BHZZ	1- 58	AP	N	C	
PSHEP2901BHZZ	1- 28	AK	N	C	
PSHEP6681BHZZ	3- 3	AF		D	
PSKR-6629BHZZ	4- 5	AL		C	
【Q】					
QCNCM1060AC03	5- 4	AB		C	
QCNCM1101CCZZ	5- 5	AB		C	
QCNCM5278NCZZ	5- 6	AC		C	
QCNCM6865RC0B	5- 7	AA		C	
QCNCM7125BH0i	5- 8	AN		C	
QCNCM7136BHZZ	2- 15	AB		C	
QCNCM7176BH0C	8- 5	AC		C	
QCNCW1057ACZZ	5- 9	AB		C	
QCNCW2822BH1A	6- 1	AF		C	
QCNCW2822BH2A	6- 2	AH		C	
QCNCW2822BH2F	5- 10	AH		C	
〃	8- 1	AH		C	
QCNCW2822BH2J	8- 2	AG		C	
QCNCW2822BH3D	5- 11	AK		C	
QCNCW2823BH3D	6- 3	AK		C	
QCNCW7081BHZZ	5- 12	AB		C	
QCNCW7201BH0i	8- 3	AH		C	
QCNCW7202BH1E	6- 4	AK		C	
〃	7- 1	AK		C	
QCNW-3041BHZZ	1- 20	AP		C	
QCNW-3042BHZZ	1- 21	AQ		C	
QCNW-3043BHZZ	1- 36	AE		C	
QCNW-3044BHZZ	1- 18	AE		C	
QCNW-3049BHZZ	2- 17	AE		C	
QCNW-3063BHZZ	1- 9	AL	N	C	
QCNW-7904BHZZ	1- 50	AE		C	
QFS-C1025CCZZ	5- 14	AF		A	
QFS-C4301CCZZ	5- 13	AE		A	
QFSHD2109AFZZ	5- 15	AC		C	
QSŌCZ2042SC32	5- 16	AE		C	
QTANZ2339BHZZ	2- 11	AE	N	C	
【R】					
RALMB6646BHZZ	5- 17	AQ		B	
RC-EZ106ARC1A	5- 18	AD		C	
RC-EZ3381QCZZ	5- 19	AR	N	C	
RC-KZ1054CCZZ	6- 5	AB		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
RCiLC2417BHZZ	5- 20	AK	N	C	
RCiLC6653BHZZ	5- 21	AS		C	
RCiLZ1003BHZZ	5- 22	AF		C	
RCŌRF2031SCZZ	1- 49	AN		C	
RCŌRF5010BCZZ	1- 57	AD		C	
RCŌRF6699BHZZ	1- 55	AU		C	
〃	3- 10	AU		C	
RCŌRF7002BHZZ	5- 23	AE		C	
RCRSP6676RCZZ	5- 24	AG		B	
RCRSZ2401RCZZ	5- 25	AL	N	B	
RMŌTM6633BHZZ	1- 35	AY		B	
RTRNP2409BHZZ	1- 13	BK	N	B	
RTRNP2410BHZZ	1- 13	BK	N	B	
【S】					
SPAKA3096BHZL	3- 2	AX	N	D	
SPAKA3096BHZR	3- 4	AX	N	D	
SPAKA8256BHZZ	4- 21	AC		D	
SPAKC3077BHSA	3- 1	AZ	N	D	
SSAKA5004CCZZ	4- 6	AA		D	
SSAKH0013HCZZ	3- 5	AA		D	
SSAKH1131QCZZ	3- 8	AA		D	
SSAKH4231CCZZ	3- 15	AA		D	
【T】					
TCADH6788BHZA	3- 13	AC		D	
TCADZ2001BHZA	3- 17	AM		D	
TGANE1001BHZC	3- 16	AG		D	
TiNSM2402BHZZ	3- 6	BD	N	D	
TiNSN7240BHZZ	3- 18	AF		D	
TLABR2258BHZZ	3- 20	AG	N	D	
TPAPR2377RCZZ	9- 1	AL	N	S	
【U】					
UBATZ6661BHZZ	1- 19	BA		B	
UBNDA6629BHZZ	3- 14	AA		C	
UKŌG-6634RCZZ	10- 12	AX		S	
UKŌG-6705RCZZ	10- 11	BC		S	
UKŌG-6725BHZZ	10- 13	BB		S	
UREL-6631BHZZ	3- 12	AH		C	
【V】					
VCCCTV1HH101J	5- 26	AA		C	
VCCCTV1HH151J	5- 27	AA		C	
VCCCTV1HH180J	5- 28	AA		C	
VCCCTV1HH221J	5- 29	AA		C	
VCCCTV1HH270J	5- 30	AC		C	
VCCCTV1HH300J	5- 31	AA		C	
VCCCTV1HH6R0C	5- 32	AB		C	
VCCSTV1HL181J	5- 33	AD		C	
VCEA2U1HW228M	5- 34	AH		C	
VCEAGA1CW337M	5- 35	AB		C	
VCEAGA1HW104M	5- 36	AB		C	
VCEAGA1HW106M	5- 37	AA		C	
VCEAGA1HW107M	5- 38	AA		C	
VCEAGA1HW225M	5- 39	AA		C	
VCEAGD1CW108M	5- 40	AE		C	
VCEAGD1CW478M	5- 41	AP		C	
VCEAJA1CW106M	6- 6	AB		C	
VCKYPU1HB101K	6- 7	AA		C	
VCKYTV1HB102K	5- 42	AA		C	
VCKYTV1HB103K	5- 43	AB		C	
VCKYTV1HF104Z	5- 44	AA		C	
〃	8- 4	AA		C	
VCQYNA1HM333K	5- 45	AA		C	
VHD1SR1544001	5- 46	AB		B	
VHD1SR159//-1	5- 47	AF	N	B	
VHD1SS353//-1	5- 48	AB		B	
VHDCP301///-1	5- 49	AL		B	
VHDDSS133HV-1	6- 8	AA		B	
VHDFMB-G24H/1	5- 50	AH		B	
VHDRB060L//-1	5- 51	AK		B	
VHEPTZ6.2A/-1	5- 52	AH		B	
VHEPTZ9.1B+-1	5- 53	AG	N	B	
VHEUDZ5.1B/-1	5- 54	AC		B	
VHi30624FG001	5- 55	BD	N	B	
VHi74F139SJ-1	5- 56	AG	N	B	
VHiBA10393F-1	5- 57	AC		B	
VHiHM128F12SL	5- 58	BN		B	
VHiKiA431F/-1	5- 59	AK		B	
VHiKiD65083AP	6- 9	AM		B	
VHiLB1843V/-1	5- 60	AM		B	
VHiLM2574-ADJ	5- 61	AU		B	
VHiMAX211CAi1	5- 62	AW		B	
VHiMC34063AM1	5- 63	AG		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
VHiMC74HC123F	5- 64	AM		B	
VHiSN74HC138N	6- 10	AL		B	
VHiSN74HC32DR	5- 65	AG		B	
VHiSN74HC374D	5- 66	AL		B	
VHiW42C3103G/	5- 67	AU		B	
VHPHDSP5621-1	6- 11	AM		B	
〃	7- 2	AM		B	
VHViCPS0.5/-1	5- 68	AF		B	
VHViCPS1.0/-1	5- 69	AF		B	
VRD-RC2EY121J	6- 12	AA		C	
VRD-RC2EY123J	6- 13	AA		C	
VRD-RC2EY270J	7- 3	AA		C	
VRD-RC2EY300J	6- 14	AA		C	
VRD-RC2EY473J	6- 15	AA		C	
VRS-FC3LG470J	5- 70	AF	N	C	
VRS-TP2EG1R0J	5- 71	AC	N	C	
VRS-TS2AD000J	5- 73	AA		C	
VRS-TS2AD100J	5- 74	AA		C	
VRS-TS2AD101J	5- 75	AA		C	
VRS-TS2AD102F	5- 76	AA		C	
VRS-TS2AD102J	5- 77	AA		C	
VRS-TS2AD103J	5- 78	AA		C	
VRS-TS2AD104J	5- 79	AA		C	
VRS-TS2AD122F	5- 80	AA		C	
VRS-TS2AD133F	5- 81	AA		C	
VRS-TS2AD153J	5- 82	AA		C	
VRS-TS2AD182J	5- 83	AA		C	
VRS-TS2AD183J	5- 84	AA		C	
VRS-TS2AD221J	5- 85	AA		C	
VRS-TS2AD222J	5- 86	AA		C	
VRS-TS2AD223F	5- 87	AA		C	
VRS-TS2AD241J	5- 88	AA		C	
VRS-TS2AD242F	5- 89	AB		C	
VRS-TS2AD270J	5- 90	AA		C	
VRS-TS2AD272F	5- 91	AA		C	
VRS-TS2AD272J	5- 92	AA		C	
VRS-TS2AD302F	5- 93	AB		C	
VRS-TS2AD330J	5- 94	AA		C	
VRS-TS2AD331J	5- 95	AA		C	
VRS-TS2AD332F	5- 96	AA		C	
VRS-TS2AD362F	5- 97	AA		C	
VRS-TS2AD472J	5- 98	AA		C	
VRS-TS2AD473J	5- 99	AA		C	
VRS-TS2AD563J	5-100	AA		C	
VRS-TS2AP161J	5-101	AA	N	C	
VRS-TS2AP203F	5-102	AB	N	C	
VRS-TS2AP392F	5-103	AB	N	C	
VRS-TS2EP151J	5- 72	AA	N	C	
VS2SA1471-RSC	5-104	AG		B	
VS2SC4153-/-1	5-105	AG		B	
VS2SD2170//-1	5-106	AH		B	
VS2SJ328-Z/-1	5-107	AP		B	
VS2SK2731//-1	5-108	AD		B	
VSKRA101M//-1	6- 16	AD		B	
VSKRA106S//-1	5-109	AF		B	
VSKRC106S//-1	5-110	AD		B	
VSKRC111S//-1	5-111	AD		B	
VSKTA1273//-1	6- 17	AF		B	
VSKTD998///-1	5-112	AS		B	
【X】					
XBPSD26P06000	1- 32	AA		C	
XBPSD30P06000	5-113	AA		C	
XBPSD40P06K00	4- 43	AA		C	
XEBSD30P06000	1- 51	AA		C	
XEBSD30P08000	1- 11	AA		C	
〃	2- 18	AA		C	
XEBSD30P10000	1- 3	AA		C	
XHBSD30P06000	1- 54	AA		C	
XHBSD30P10000	1- 16	AA		C	
XHBSD30P12000	4- 33	AA		C	
XHBSD40P06000	1- 12	AA		C	
XHBSD40P12000	4- 35	AA		C	
XHPSC30P08000	4- 42	AA		C	
XHPSD30P08000	4- 45	AA		C	
XHSSD30P06000	4- 20	AA		C	
XJPSD30P06000	2- 12	AA		C	
XJSSD26P08000	1- 27	AA		C	
XNESD60-50000	4- 13	AA		C	
〃	4- 40	AA		C	
XRESJ40-06000	4- 12	AA		C	
XRESJ50-06000	4- 16	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
XUBSD30P08000	4- 2	AA		C	
XUBSD40P10000	1- 41	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	

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